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Enhanced Terminal Voice Switch (ETVS)

Project Implementation Plan (PIP)

U.S. Department of Transportation

Federal Aviation Administration

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1.0 GENERAL

1.1 Purpose of Document

This Project Implementation Plan (PIP) provides management and technical guidance for the implementation of the Enhanced Terminal Voice Switch (ENS), and is to be used for all ENS technical and resource planning activities.

1.2 Scope Of Document

This PIP is restricted to all aspects of ETVS implementation, beginning with site surveys and site preparation and ending with equipment maintenance, training, and configuration management (CM).

1.3 Distribution

This PIP will be distributed at the branch level to the offices of the Program Director for Communications and Aircraft Acquisition, National Airspace System (NAS) System Engineering, Operations Services, and Air Traffic Plans and Requirements Services: branch level to the Engineering, Test, and Evaluation Service at the FAA Technical Center, the FAA Academy and the FAA Logistics Center at the Mike Monroney Aeronautical Center; branch level to the regional Airway Facilities divisions: and limited distribution to all field offices for Air Traffic and Airway Facilities.

1.4 Definition of Terms

Appendix C contains definitions of terms, abbreviations, acronyms used in this document. A list of the FAA and DoD organizations referred to in this document is also provided.

1.5 Cancellation

Not applicable (N/A).

1.6 Authority to Change

Authority to change this PIP rests with the Program Manager for Voice Switching and Recording, ANC-200, and the Manager, Implementation Management Division, ANS-200.

1.7-1 .19 Reserved

1.20 Status Assessment Overview

Issues and risks addressed in the Status Assessment sections of this Project Implementation Plan are derived from incomplete data or information in the relevant chapter and their impacts on site implementation. The incomplete information will be supplied as soon as it is available with a revision to this document. Status Assessment will also address the plans or potential solutions proposed to mitigate the identified problems.

The ETVS risk management process, as defined in the ETVS Risk Management Plan, will involve the identification, analysis, evaluation, mitigation, and monitoring of risks associated with the implementation of the ENS project. Risks can be identified through any source providing insight into the program. Once a risk has been identified, documented, and reported to management, the risk issue is assigned by the relevant Associate Program Manager to an actionee, who will perform a risk analysis. Once a risk is identified, analyzed, and ranked, a mitigation plan is prepared, and the analysis finding along with the recommended mitigation plan is forwarded to the Risk Evaluation Board for evaluation and approval. Once a risk mitigation plan has been established, accurate documentation and continued evaluation are important to assure that:

. The expected results are obtained;
- Factors attendant to the risk have not changed: and,
- No new risks have been introduced.

Refer to section 12.4.2 of this document for more detail on risk management. (ENS Risk Management Plan, 2/11/94)

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Refer to section 12.4.2 of this document for more detail on risk management. (ENS Risk Management Plan, 2/11/94)

2.0 PROJECT OVERVIEW

2.1 Synopsis of Mission Need

One of the many responsibilities of the FAA, in support of the National Airspace System (NAS), is to provide reliable Air-to-Ground (A/G) and Ground-to-Ground (G/G) voice switching communications between air traffic controllers, pilots, and other ground based air traffic facilities. The FAA initiated the ENS procurement to keep pace with rapid advances in telecommunications technology, offer additional functional and operational capabilities, and improve performance and reliability. The ETVS, an integrated voice switching system, will fulfill connectivity requirements in facilities ranging from medium sized, level III Air Traffic Control Towers (ATCTs), to large level V consolidated ATCT/Terminal Radar Approach Control (TRACON) facilities with up to 150 operational positions. This includes Metroplex Control Facilities (MCFs) and Limited Consolidation Facilities (LCFs). [ETVS Mission Need Statement, 1 0/20/92]

2.1.1 Operational Needs

The ETVS will meet operational needs such as:

- Access to A/G (radios) and G/G (intercom or interphone) communications from any operational position.
- Interface capability to air traffic control legal voice recorders.
- Access to an administrative telephone system, such as the Operational Support Telephone System (OSTS).
- Dynamic reconfiguration of operational position equipment.
- Capability for voice switch expandability to keep pace with expanding requirements.
- Capability to provide Remote Maintenance Monitoring (RMM) of voice switches.
- Improved human-machine interfaces.
- Improved management support systems to reduce workload of controllers and supervisors. [ETVS Mission Need Statement, 1 0/20/92]

2.1.2 Strategic Goals

The ETVS will be installed in approximately 450 sites over a ten year period. Core ETVS equipment will incorporate Non Developmental Item (NDI) technology supporting up to 150 operational positions. The Pre-Planned Product Improvements (P^3I), listed in Table 2-1, will be incorporated over time based on the capabilities of the selected vendor and changing communications requirements. The ETVS will integrate changes to voice switching systems to improve the reliability, expandability, flexibility, and simplicity of the switch. Improvements over currently available terminal voice switching systems include:

- Remote Monitoring Subsystem (RMS) to collect and report maintenance related data to other components of the Remote Maintenance Monitoring System (RMMS);
- Cross connect interfaces for monitoring of the Automated Terminal Information Service (ATIS);
- Provisions for a Management Information System (MIS) to automatically collect routine administrative and personnel data, greatly reducing the workload of the air traffic supervisor;
- Communications Traffic Data (CTD) and system event collection and reporting to provide an accurate summary of communications utilization data and information on position activity for use by supervisory and maintenance personnel in system troubleshooting, incident investigation, resource allocation, and workload assessment;
- Informal recording capability at the supervisory position to record incoming or outgoing calls to any position for use by supervisors in assessment of controller performance; and,
- Digital Ground-to-ground (G/G) communications interfaces for connecting the ETVS to digital carriers, such as T-l and Integrated Services Digital Network (ISDN). [ETVS Operational Requirements Document, 1 1/10/93, 1]

Potential ETVS Pre-Planned Product Improvements (P^3I)
Digital interfaces (i.e., ISDN, T-I, etc.)
Automated Terminal Information Service (ATIS) support
Management Information System (MIS)
Communications Traffic Data (CTD) and system event collection and reporting
Remote Monitoring Subsystem (RMS) and Maintenance Data Terminal (MDT) interfaces
Four jack position operation
Type-20 trunk interface (VSCS to voice switch interface)

7/19/94

Table 2-1 Potential ETVS Pre-Planned Product Improvements (P^3I)

2.2 Functional Description

Figure 2-1 illustrates the connectivity of the ETVS. Detailed functional and technical requirements can be found in the ETVS Operational Requirements Document (ORD) and FAA-E-2894, Enhanced Terminal Voice Switch Specification. A discussion of the general functional capabilities of the ETVS follows.

2.2.1 Communications Features

The ETVS will provide G/G and A/G communications to ATCTs, TRACON facilities, and other remote FAA and non-FAA locations. Communications capabilities will include direct and indirect access intercom and interphone communications, with or without override (the ability to join the call of the party being called, as in a conference call). The ETVS will also interface to digital and analog G/G carriers and analog A/G radio equipment.

2.2.2 Supervisory Features

Supervisory features of the ETVS include the capability to record incoming and outgoing calls at any operational position, display of pending maintenance alarms, and an audible alarm for unmonitored frequencies. A Management Information System (MIS) will provide supervisors with routine administrative and personnel data (position utilization, training, and supervision). Communications Traffic Data (CTD) and system event collection and reporting will provide a summary of communications utilization, and more detailed position activity information, to both supervisory and maintenance personnel. Both the MIS and the CTD are P^3I items.

2.2.3 Maintenance Features

ENS systems include automated diagnostic equipment that provides real time monitoring of critical system components. Aural and visual alarms located at a maintenance position and at designated operational positions will alert personnel of failures. A diagnostic display terminal will identify the defective component(s) to the Line Replaceable Unit (LRU) level.

2.2.4 Special Features

The ETVS will provide software controlled functional reconfiguration capabilities to air traffic supervisors for changing interphone, intercom, and radio frequency connectivity within a facility. One or more designated interactive terminals will provide computer based reconfiguration for single positions or all ETVS positions. As directed by Air Traffic Plans and Requirements Service, maintenance personnel can accomplish physical reconfiguration by the addition of single positions or single external interfaces to the system.

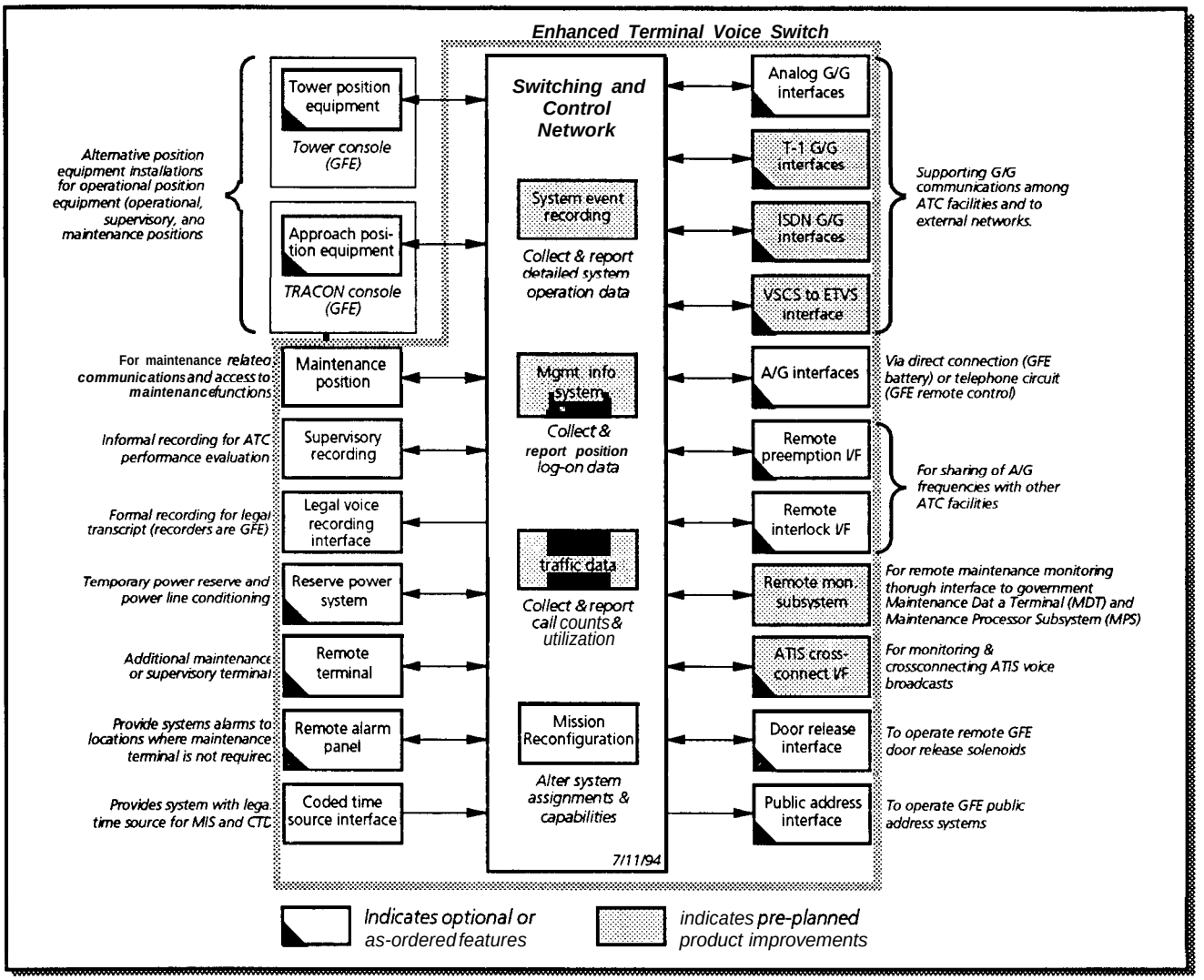

Figure 2-1 ETVS Functional Block Diagram

The ETVS will interface to the Maintenance Processor Subsystem (MPS), located at Air Route Traffic Control Centers (ARTCCs), through the Remote Monitoring Subsystem (RMS). The RMS will integrate the ETVS into the Remote Maintenance Monitoring System (RMMS). RMS implementation will take place as a P^3I subsystem. [ENS Specification, 7/26/94]

2.3 Program History and Status

In 1988, the Tower Communications Switch (TCS) project was developed to replace electromechanical voice switches with "end state" voice switching equipment. The TCS was to procure voice switches for towers in the Advanced Automation System (AAS) environment. The TCS project, however, was deferred in 1990 after a review of field requirements revealed an immediate need for voice switches to fulfill communications requirements in aging NAS facilities. The Terminal Voice Switch Replacement (TVSR) program rescoped the Integrated Communications Switching System (ICSS) Phase 1 B and Small Tower Voice Switch (STVS) projects. The STVS would replace electromechanical voice switches in facilities requiring four or fewer positions, while the ICSS Phase 1 B would replace voice switches in larger facilities. A requirement remained for an "end state" voice switch that could meet the requirements of a more technologically advanced environment. The ETVS was conceived to maintain current voice switch

capabilities as well as updating obsolete technology by interfacing to RMMS and digital networks, embedding both Management Information System (MIS) and Communication Traffic Data (CTD) collection capability, and providing the expandability to meet Metroplex Communications Facility (MCF) requirements.

Development of the ETVS Mission Need Statement (MNS) occurred in April 1992. The Department of Defense (DoD) expressed an interest in participating in a joint procurement to fulfill their terminal voice switching needs for approximately 165 switches. The MNS and the ETVS program were approved at Key Decision Point (KDP) 1 in October 1992. The ETVS Operational Requirements Document (ORD) was developed in January 1993, and on February 1, 1993 a draft specification was completed and released for industry review as part of a market survey. The market survey was completed in October and the specification was revised to reflect industry comments. An initial Cost/Benefit Analysis was also completed in October.

Acquisition Review Committee (ARC) approval (KDP-2), signaling entry into phase 3 (development phase), was conditionally granted in February 1994. A Procurement Readiness Review (PRR), was completed in June 1994, and will be followed by the release of the ETVS Request for Proposals (RFP) in July. Contract award is expected in July 1995. First Article (factory) Test will be completed, and in October 1996 when the first operational FAA switch will be fielded. Operational Department of Defense ETVS systems are expected in October 1996.

2.4 Program Milestones

See figure 2-2, ETVS Milestones, for program level milestones. Test and evaluation milestones are listed in figure 9-3, ETVS Test and Evaluation Schedule, found in section 9.2. NAS implementation milestones are listed in figure 1 l-l, ETVS NAS Implementation Schedule, found in section 11.1. Site implementation milestones are listed in figure 11-2, Site Implementation Milestone Schedule, found in section 11.3. Configuration management milestones are listed in figure 12-1, CM Milestones, found in section 12.5.3.

2.5 Interagency Involvement

2.5.1 Department of Defense

The ETVS program is being procured jointly by the FAA and the DoD. Responsibility for program development and contractor evaluation lies with the FAA. DoD is expected to participate in any or all phases of this activity. The DoD component responsible for procurement of the ETVS is the United States Air Force (USAF) Electronic Systems Center Communications and Airspace Management Systems Directorate (ESC/TG).

The DoD program office will coordinate with the FAA on all DoD specific requirements of the ETVS. A representative of the DoD program office will review all test documentation to assure that DoD critical T&E concerns have been addressed.

A memorandum of agreement between the FAA ad DoD identifies 164 systems Army, 97 Air Force, and 32 Navy). Current deliveries of ETVSs for the DoD are scheduled to begin in 1996.

2.5.2 National Weather Service

No interfaces with this agency exist or are expected.

2.5.3 U.S. Customs Service

No interfaces with this agency exist or are expected.

2.5.4 Drug Enforcement Agency

No interfaces with this agency exist or are expected.

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3.0 AIRWAY FACILITY OPERATIONS

3.1 Summary of Maintenance Operations Impacts

3.1.1 Transitory State

AF F&E personnel will be involved in all phases of ETVS site implementation. F&E personnel will provide and manage electronics engineering resources and will oversee all site installation activities. Section 3.3, Facilities and Equipment provides additional detail on F&E site implementation activities.

They will also be responsible for conducting the JAI and updating personnel and equipment certification requirements to reflect ETVS equipment, as well as declaring Initial Operating Capability (IOC) and the Operational Readiness Date (ORD) for the ETVS system. Section 3.4, Systems Maintenance provides more detail regarding site implementation activities.

3.1.2 Operational State

No changes to AF operations are anticipated from operational use of the ETVS in the NAS. ETVS site level maintenance will initially be provided by the contractor through Interim Contractor Maintenance and Logistics Support (ICMLS). After an ETVS hardware maintenance training course (see section 8.3.1, Training Program) is in place, site maintenance will be performed by trained FAA on-site technicians. Depot repair service will be provided by the contractor for the duration of the ETVS contract. After expiration of the Contractor Repair Service (CRS) provision in the contract, the FAA Logistics Center (FAALC) will assume responsibility for providing support until the ETVS is replaced. [ETVS Statement of Work, 8/9/94, 3.6]

3.2 Airway Facility Procedural Changes

3.2.1 Preventive Maintenance

No changes to the AF preventative maintenance approach will be required as a result of the ETVS project. No specific preventative maintenance actions will be required for the ETVS. Preventative maintenance will be accomplished while performing corrective maintenance procedures and will be necessary no more than twice per year. Preventative maintenance will cause service interruption on no more than one position or external interface at a time, and will require no more than two hours per visit, regardless of system size. [ETVS Statement of Work, 8/9/94, 3.6.6.3; ETVS Maintenance Requirements Document, 12/3/93, 4.1; ETVS Specification, 7/26/94, 90.3.2]

3.2.2 Corrective Maintenance

Initially, no changes to the AF corrective maintenance approach will be required as a result of the ETVS. Corrective maintenance will be accomplished by contractor personnel until the FAA technicians have completed training for the ETVS.

Regardless of size or configuration, the ETVS will exhibit a mean time between failures for access to any A/G frequency or G/G circuit from any operational or supervisory position of not less than 10,113 hours. Any corrective maintenance action will require no more than ninety minutes and no more than two people at the same time to complete. The reliability requirements stated in the ETVS specification are traceable to NAS-SR-1000, and will provide an availability of at least 0.99999, with any loss of a critical service (i.e., A/G or G/G communications) not exceeding 6 seconds. [ETVS Specification, 7/26/94, 90.2, 90.3]

3.2.3 Software Maintenance

Software maintenance will be performed only by contractor personnel with AOS-240, Navaids/Communications Support Engineering Branch, oversight, throughout the life cycle of the ETVS equipment. [ETVS Statement of Work, 8/9/94, 3.6.6.3, 3.6.6.4.2; ETVS Integrated Logistics Support Plan, 2/18/94, 5.4]

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4.0 AIR TRAFFIC OPERATIONS

4.1 Summary of AT Operational Impacts

The ETVS will be fully consistent with current operational concepts of terminal ATC communications. The ETVS will duplicate the basic functions and features of current equipment, and will add enhancements in the form of new features for operators (i.e., controllers) and supervisors. [ETVS Operational Requirements Document, 11/10/93, 2.1]

4.1.1 Transitory State

The replacement of obsolete voice switching equipment may include the interruption of communications functions at a limited number of operational positions during cutover. Interruption in service will be minimal and occur on a non-interfering basis. These interruptions will not affect the ability of the facility to provide reliable air-to-ground and ground-to-ground air traffic control services (see section 9 for details pertaining to on-site testing). [ETVS Statement of Work, 8/9/94, 3.5.3.4]

4.1.2 Operational State

Several changes to AT operations are anticipated when several of the ETVS Pre-Planned Product Improvement (P^3I) additions are implemented. The Advanced Terminal Information Service (ATIS) monitoring feature in the ETVS P^3I package will allow air traffic controllers and supervisors to listen to ATIS messages (verbal briefings on prevailing airport conditions to pilots via VHF radio) through a headset or loudspeaker as they are transmitted. The ETVS will also include a Management Information System (MIS) as a P^3I improvement. The MIS will automatically collect routine administrative and personnel data, reducing the workload of the air traffic supervisor. The Communications Traffic Data (CTD) and system event collection and reporting P^3I will provide an accurate summary of communications utilization data and information on position activity for use by air traffic supervisors. This data will aid in system incident investigation, resource allocation, and workload assessment. Specific AT procedural changes with regard to these enhancements will be coordinated through the Air Traffic Rules and Procedures Service, Terminal Procedures Branch, ATP-120, with input from human resource personnel and union representatives, prior to implementation of the ETVS. [ETVS Specification, 7/26/94, 100.1, 110.1, 120.1]

4.2 AT Procedural Changes

4.2.1 ATC Operational and Management Procedures

The only change to AT operational and management procedures anticipated with the implementation of the ETVS will be a result of the Advanced Terminal Information Service (ATIS) monitoring feature in the ETVS P^3I package. This feature will allow air traffic controllers and supervisors to listen to ATIS messages through a headset or loudspeaker as they are transmitted. Specific AT procedural changes with regard to this enhancement will be coordinated through the Air Traffic Rules and Procedures Service, Terminal Procedures Branch, ATP-120, prior to implementation of the ATIS P^3I package. No other changes to air traffic controller operational or management procedures are anticipated as a result of ETVS implementation. [ETVS Specification, 7/26/94, 100.1]

4.2.2 Flight Procedures/Standards

The ETVS will be fully consistent with the current flight procedures and standards of terminal ATC communications. No impact on flight procedures or standards is anticipated.

4.2.3 Administrative and Management Procedures

The implementation of Management Information System (MIS) and Communications Traffic Data (CTD) functions will improve administrative and management capabilities by providing accurate tracking of routine administrative and personnel data. The MIS feature will automate the collection of data on time-on-position and training and will greatly reduce the administrative workload of the air traffic supervisor. The CTD and system event collection and reporting P^3I will provide an accurate summary of

communications utilization data required to make informed decisions regarding communications resource allocation, workload leveling, and system studies. Specific AT procedural changes with regard to these enhancements will be coordinated through the Terminal Procedures Branch, ATP-120, prior to implementation of the MIS and CTD P3I packages. [ETVS Specification, 7/26/94, 110.1, 120.1]

4.2.4 Software Verification Procedures

ETVS software verification procedures will be completed using the current AOS software verification procedures.

4.2.5 Inter-facilityProcedures

The ETVS will be fully consistent with the current inter-facility procedures of terminal ATC communications and no impact on inter-facility procedures is anticipated.

4.2.6 Personnel Certification Procedures

The ETVS will be fully consistent with the current personnel certification procedures of terminal ATC communications. No changes to personnel certification procedures are anticipated.

4.2.7 System Backup/Cutover Procedures

The ETVS will be fully consistent with the current system backup/cutover procedures of terminal ATC communications. No changes to system backup/cutover procedures are anticipated as a result of the implementation of the ETVS project.

4.3 ATImplementation

Regional Air Traffic personnel will be required to coordinate a delivery schedule for ETVS sites with ATR-120, System Plans and Requirements Service, Terminal Branch. In addition, AT personnel will help to define AT operational requirements, determine new plans and procedures to be used after implementation, oversee the conduct of site surveys and preparation of site survey documentation, and participate in, or monitor, FAA operational testing at each site. All AT operations at the site and controller involvement in testing procedures will be coordinated through the AT manager prior to the start of testing. Please refer to Table 9-6, Personnel Requirements to Support ETVS Testing, as well as section 9.4.1, Personnel Requirements, for more detail concerning AT involvement in FAA operational testing activities. Sections 13.2.2, Pre-Installation and Checkout Phase, 13.2.4, System Integration Phase, and 13.2.5, Field Shakedown Phase also contain information concerning the role and schedule of AT personnel in ETVS Implementation.

4.4-4.19 Reserved

4.20 Status Assessment

The baseline ETVS system meets the current requirements of the operational system. Risk is minimized by segregating the upgraded functionalities into P3I packages. These can be developed as standalone upgrades and added individually to the baseline system as P3I capabilities are developed by the contractor. AT community involvement will be essential during all phases of the procurement to continually keep user requirements at the forefront of the acquisition.

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In the event that ETVS implementation displaces old voice switching equipment that contains the facility's Administrative Telephone System (ATS) as an integrated subsystem, an OSTS will be required to provide administrative telephone service to the site. The old voice switch backroom equipment will be used to provide interim ATS service until an OSTS can be installed at the site. Section 13.2.6, Dual Operations Phase, contains more details concerning use of the replaced voice switch as an interim ATS.

5.1.2.3 Automated Terminal Information Service (ATIS)

ATIS provides verbal briefings on prevailing airport conditions to pilots via a discreet radio frequency. Implementation of ATIS support capability as a P3I will allow controllers direct access to ATIS information given to pilots. The ENS will provide ATIS cross connect and monitoring capabilities. Cross connect refers to the connection of outgoing ATIS voice messages from ATIS recorders to specified VHF radio transmitters. Monitoring denotes the ability to listen to the ATIS messages via ENS headset or loudspeaker as they are transmitted. [ETVS Specification, 7/26/94,100.1]

5.1.2.4 Remote Maintenance Monitoring System (RMMS)

The RMMS provides a system to automate FAA maintenance operations. It provides monitoring and control equipment for most FAA facilities so that equipment performance monitoring, control, and certification can be accomplished from centralized work centers. [Capital Improvement Plan, 3/94, 2-6-1]

The ETVS will be equipped with a Remote Monitoring Subsystem (RMS) as a P3I for connection to a government-furnished Maintenance Processor Subsystem (MPS) and Maintenance Data Terminal (MDT). The RMS, MPS, and MDT are all considered part of the RMMS. The RMS will issue alarm messages to the MPS upon detection of critical failures (i.e., failures that interrupt A/G or G/G communications), alert messages upon detection of non-critical failures, and return to normal messages for all alarm or alert conditions that have been cleared. [ETVS Specification, 7/26/94,130.1, 130.2.1.2]

5.1.2.5 Leased Inter-facility NAS Communications System (LINCS)

LINCS is a project which allows the FAA to lease transmission channels for both analog and digital communications. LINCS transmission systems include Metropolitan Area Networks (MetroNets), which provide channels in the general vicinity of large metropolitan areas, Intra-LATA Networks (IntraNets), which provide channels within individual local access and transport areas (LATAs), and Inter-LATA Networks (InterNets), which provide channels between LATAs within the contiguous United States. [Functional Specification for LINCS, 3/15/90, 1 .1]

5.2 Platform Architecture

The ETVS will be installed and used as part of the terminal platform in two environments including Air Traffic Control Tower (ATCT) cabs and Terminal RADAR Approach Control (TRACON) facilities (including consolidated TRACON facilities, such as Metroplex Control Facilities - MCFs).

Airport Traffic Control Tower (ATCT) cab. The ATCT cab is used for the control of air traffic within visual range of the airport (including ground traffic). The ATCT cab is generally located at the top of a tower that can be 125 feet high or more, and generally has fewer than ten positions. Some ATCT cabs incorporate approach control positions and may require more ENS position equipment for this function.

Terminal Radar Approach Control (TRACON) facility. The TRACON is used for the control of aircraft on approach or departure within radar range of the airport. Frequently, TRACONs are located immediately below a ATCT cab in a closed, darkened rooms to facilitate visibility of the radar displays. The TRACON may have ten or more positions.

5.2.1 Interim Platform Configuration

Interim platform configuration will involve the ETVS being used in the ATCT cabs and TRACON control rooms as described above. It is possible, at previously operational sites, that the voice switch being replaced will be retained for use as an Administrative Telephone System (ATS). Some current voice

switches incorporate the ATS as an integral part of the backroom equipment. This backroom equipment will be retained until a replacement ATS, an Operational Support Telephone System (OSTS) (see section 5.1.2.2), can be delivered and installed. Please refer to section 13.2.6, Dual Operation Phase, for more details.

5.2.2 Target State Configuration

The NAS target state configuration will incorporate the ETVS into the terminal environment. The ETVS will be installed and operated in ATCTs and TRACONs as described in section 5.2 .

5.3 Subsystem Level Architecture

ETVS systems will be modular and will be installed fully wired for the maximum number of positions within a size group (refer to Table 5-1, System Floor Space Allocation, for basic system configurations and sizes). The ETVS will interface with government-furnished air-ground communications equipment, either locally or remotely. The ETVS will also interface with the existing interphone network, consisting largely of government-furnished point-to-point and multipoint dedicated lines using a variety of signaling and supervision techniques, permitting operators to communicate with other ATC facilities. The ETVS will interface with external telephone networks such as facility private automated branch exchange (PABX), public switched telephone network (PSTN), federal telecommunications system (FTS), and others, permitting operators to communicate with outside organizations and individuals. A P3I upgrade will provide direct interface to a variety of digital voice communications circuits (such as T-l carriers and the integrated services digital network or ISDN) to replicate current interphone and external network communications functions wherever transition from analog to digital is practical and cost-effective.

5.3.1 Hardware

5.3.1.1 Position Equipment

Operational positions will be provided for air traffic controllers and specialists and will provide Air-to-Ground (A/G) and Ground-to-Ground (G/G) communications capability using direct and indirect access selectors, A/G frequency control displays, headset jack modules and volume controls, sidetone control, position loudspeakers, footswitch and hand microphone operation, facility entry door release, legal voice recording, and split position operation. The position equipment will be sized to fit in both tower and TRACON consoles. Section 6.8.1, Space Requirements, describes position equipment size. [ETVS Specification, 7/26/94, 10.2]

5.3.1.2 Supervisor's Workstation

The supervisory workstation will be used to initiate and edit configuration maps, access MIS and CTD information, and obtain operational status information. The supervisor's position will most likely consist of a stand alone device, such as a microcomputer and monitor. Section 6.8.1, Space Requirements, gives details concerning supervisor's workstation equipment size. [ETVS Specification, 7/26/94, 10.2.2]

5.3.1.3 Maintenance Workstation

The ETVS maintenance workstation will be used by maintenance personnel to initiate and edit configuration maps, add new system capabilities, detect and localize system faults, monitor position equipment and external lines, and to test and repair the system. Section 6.8.1, Space Requirements details maintenance workstation equipment size. [ENS Specification, 7/26/94, 10.2.3]

5.3.1.4 Reserve Power System

The ETVS will require continuous, conditioned power. The ETVS will be connected to the critical power bus if one exists and can accommodate the load imposed by the system. If the addition of the ETVS load exceeds current critical power bus capacity or if critical power is unsuitable (i.e., noisy), a reserve power system will be delivered with the ETVS equipment. A reserve power system will also be provided in the event that conditioned backup power cannot support emergency ETVS operation (i.e., no critical power bus).

The ETVS reserve power system will provide at least 20 minutes of power reserve in the event of power failure and conditioning of the government furnished power supply in case if required. The reserve power system will provide graceful termination of ATC operation in the event of a long term power failure and a temporary bridge for temporary failures and "brownouts". Section 6.8.1, Space Requirements, gives details concerning reserve power system equipment size. [ETVS Specification, 7/26/94, 50.2.3]

5.3.1.5 Supervisory Recording

The ETVS will offer the capability for supervisors to make informal and impromptu voice recordings of position communications for the purpose of evaluating controller performance. They will initially be accomplished through the use of standard off-the-shelf cassette recorders. [ETVS Specification, 7/26/94, 10.3.6.1]

5.3.2 Software

The ETVS Specification is a system level document and does not make differentiate between the utilization of hardware or software to meet functional requirements. As an NDI procurement, ETVS equipment could be any combination of hardware and software that meets functional requirements. Identification of major software functions and packages (Computer Software Configuration Items - CSCI) will occur during the System Review. Identification of configuration items will occur during the Physical Configuration Audit (PCA).

5.3.3 Physical Specification

ETVS equipment room cabinets and frames will be no larger than 72 inches high, 36 inches wide, and 30 inches deep. A fully loaded cabinet will not exceed an average weight distribution of 125 lb/ft². Maximum floor space for ETVS backroom equipment is given in Table 5-1, System Floor Space Allocation. Section 6.8.1, Space Requirements, gives details concerning position equipment, supervisory workstation, and maintenance workstation sizes. [ETVS Specification, 7/26/94, 50.3.3.1, Table 150-1]

System Class	Operator Positions	A/G & G/G Interfaces	Maximum Floor Space
Basic System 1 (BS-1)	8	24	6 feet x 4 feet
Basic System 2 (BS-2)	16	40	8 feet x 8 feet
Basic System 3 (BS-3)	40	100	8 feet x 12 feet
Basic System 4 (BS-4)	80	200	12 feet x 13 feet
Basic System 5 (BS-5)	150	475	13 feet x 14 feet

7/28/94

Table 5-1 System Floor Space Allocation

5.45.19 Reserved

5.20 Status Assessment

The NAS target state for ETVS has not been formally defined at this time. The ETVS project, however, was based on modifications to the Tower Control System (TCS) end-state NAS voice switching project, and, therefore, a low risk is associated with **this level of information.** Market Survey information identified several vendors of voice switching equipment that could meet the configuration requirements set forth in the ETVS specification. ETVS platform architecture will be defined after contract award. Risk associated with the type of platform used by a vendor will be minimal. Several system configurations are commercially available to meet the requirements set forth in the ETVS specification. Each configuration will be comprehensively evaluated during the Technical Evaluation and thoroughly tested during verification at both the vendor's factory and the FAA Technical Center. Supportability, among other issues, will be addressed during the Technical Evaluation.

6.0 PHYSICAL FACILITIES

6.1 Real Estate

6.1.1 Real Estate Requirements

The ETVS will be located inside the tower or TRACON facility. Additional purchase or leasing of real estate is not anticipated.

6.1.2 Real Estate Plans

No real estate plans have been made to date.

6.2 Heating, Ventilation, and Air Conditioning (HVAC)

6.2.1 HVAC Requirements

ETVS operational temperature range is from 10 to 40°C, with a relative humidity of 10 to 80% non-condensing. These parameters are in accordance with FAA-STD-032, Design Standards for National Airspace System Physical Facilities, paragraph 3.5.2, which specifies the same environmental requirements for spaces housing communications equipment. [ETVS Specification, 7/26/94, 50.9.1]

6.2.2 HVAC Plans

The ATCT cabs and TRACONs where the ETVS will be deployed are already temperature and humidity controlled environments. Modifications to existing cooling capability could be required based on the additional heating loads generated by the ETVS equipment

6.3 Cables

6.3.1 Cable Routing/Raised Floor Requirements

Cable access between the ETVS backroom equipment cabinets and position equipment, supervisory workstation, maintenance workstation, reserve power, government furnished legal recorder, and government distribution frame will be required. Position equipment, supervisor workstations, and maintenance workstations can be located no more than 15,000 cable feet from the backroom equipment. Site specific cabling requirements will be determined at the time of the site survey. [ENS Specification, 7/26/94, 50.3.4, 150.2.6]

The ETVS will provide an Intermediate Distribution Frame (IDF) and required cables to facilitate the interconnection of the ENS IDF the FAA equipment distribution frame(s). The ETVS IDF will be provided with blocks that allow incoming cables to be terminated on quick-connect terminals. Each ETVS IDF will accommodate at least 25 percent more connections than required for the site at which the IDF is installed. [ETVS Specification, 7/26/94, 50.3.3.5]

All interconnection cables and connectors required for factory testing site installation, checkout, acceptance testing, cutover, operation, and maintenance will be compatible with both under floor and overhead distribution and cable facilities provided by the government. Cabling and wiring will comply with 3.3.1.3.4.26 of FAA-G-2100; National Electric Code, NFPA-70; and FAA-C-I 217. All interconnecting cables will be polonium-rated in accordance with NFPA-70 725-38 and 800-53, for cabling in raceways. [ETVS Specification, 7/26/94, 50.3.4]

All cable connectors furnished on the equipment for making external connections will be clearly identified on the plug-in side by labels descriptive of their specific function and by the proper reference designation. Cable connectors will be mechanically keyed to prevent incorrect installation and hookup. The mating connector part (connector or plug) that is electrically energized will contain female contacts. All cable connectors will be mechanically retained in place. [ETVS Specification, 7/26/94, 50.3.4.1]

6.0 PHYSICAL FACILITIES

6.1 Real Estate

6.1.1 Real Estate Requirements

The ETVS will be located inside the tower or TRACON facility. Additional purchase or leasing of real estate is not anticipated.

6.1.2 Real Estate Plans

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6.6 Environmental/HAZMAT

6.6.1 Environmental Monitoring Requirements

The ETVS will pose no environmental hazards (toxic materials or gasses) to position operators or maintenance personnel. [ETVS Specification, 7/26/94, 50.3.6.2]

Some facilities may contain hazardous materials (HAZMAT) that may be disturbed during site preparation or installation. For example, in order to route cabling for the new system, it may be necessary to drill holes in floor tiles containing asbestos. Installation may require displacing chemical batteries that are contained in power supply systems for other equipment at the facility. HAZMAT items will be identified during the site survey.

6.6.2 Environmental Monitoring Plans and Procedures

The ETVS will be constructed of low toxicity materials that will not emit dangerous gasses due to fires or toxic conditions when used according to the environmental operating conditions described in the ETVS Specification. The reserve power system shall not vent hazardous gasses. [ENS Specification, 7/26/94, 50.3.6.2]

Hazardous materials will be identified during the site survey by regional Facilities and Equipment (F&E) personnel (AXX-45X). A HAZMAT mitigation plan will be developed by regional F&E personnel which identifies procedures for handling and disposing of hazardous materials. Such activities will be funded as part of site preparation activities by the program office (refer to section 7.1.2.1, Site Preparation Funding).

6.7 Grounding, Bonding, Shielding, and Lightning Protection

6.7.1 Grounding, Bonding, Shielding, and Lightning Protection Requirements

The ETVS will require a separate grounding network as necessary for AC power ground, chassis ground, signal ground, and trunk circuit ground at all installations. It is the site's responsibility to ensure that equipment interfacing with external transmission facilities will be secured, at the master demarcation frame, against damage due to lightning surges. [ETVS Specification, 7/26/94, 50.2.4, 50.2.5]

6.7.2 Grounding, Bonding, Shielding, and Lightning Protection Plans

The government will provide the single-point earth ground for AC power ground at all installations. The ETVS will ground all AC components to a common ground derived from the AC power system. The ETVS will also provide separate chassis, signal and communications trunk circuit grounding. The ETVS will be shielded against high voltage damage due to lightning surges, and will provide lightning surge protection of equipment interfacing with external transmission facilities in accordance with FAA-STD-020. [ETVS Specification, 7/26/94, 50.2.4, 50.2.5]

6.8 Space

6.8.1 Space Requirements

Actual equipment dimensions will be identified after contract award. The ETVS specification identifies target dimensions as follows:

Operational position equipment will be as small as possible (while still meeting functional requirements set forth in the ETVS specification), but will require an area no larger than 400 square inches panel cutout area, and 12 inches deep. Supporting equipment, if necessary, will fit in a space 12 inches high, 12 inches wide, and 15 inches deep. The ETVS will provide a choice of position equipment configurations to suit various requirements, such as compact integrated panels, touch-entry displays, standard rack-mount units, and modularly-expandable position equipment. [ETVS Specification, 7/26/94, 150.2.1]

Supervisory position equipment will require a desktop space of 3 feet by 3 feet. [ETVS Specification, 7/26/94, 150.2.2]

Maintenance workstations will require a desktop space of 3 feet by 3 feet. Other maintenance equipment will fit in the space allotment for the central equipment rack. [ETVS Specification, 7/26/94, 150.2.3]

ETVS central equipment, including the reserve power supply, will require floor space as defined in Table 5-1, System Floor Space Allocation. [ETVS Specification, 7/26/94, 150.2.5, Table 150-1]

6.8.2 Space Allocation Plans

Elevation drawings showing the location of all ETVS position equipment, supervisory and maintenance workstations, and backroom equipment will be provided in the Site Installation, Integration, and Acceptance Test Document (SIIATD), CDRL E02. The SIIATD will also specify all modifications to FAA equipment required during installation. Drawings will be provided detailing the distance existing equipment will be moved and the location of any new equipment. [ETVS Data Item Description E02, April 1994, 10.3.3.k]

6.9 Construction and Modification

6.9.1 Construction and Modification Requirements

Aside from possible cable routing alternations or equipment anchoring, no modification to facilities are expected for the installation of the ETVS.

6.9.2 Construction and Modification Plans

Cable routing and possible facility modification will be addressed on a site specific basis after the completion of the site survey. Any required construction or building modifications will be identified in the site specific appendix to the Site Installation, Integration, and Acceptance Test Document (SIIATD), CDRL E02. Funding for construction or modification materials required for site preparation will be provided to the regions by the program office, ANC-200. Labor charges associated with construction during site preparation will be funded by the regions (refer to section 7.1.2.1, Site Preparation Funding). [ETVS Data Item Description E02, April 1994, 10.3.3.a]

6.10 Telecommunications

6.10.1 Telecommunications Requirements

The ETVS will require access to G/G and A/G interfaces at a government distribution frame to establish communications capabilities offered by the voice switch.

6.10.2 Telecommunications Plans and Procedures

The ETVS will contain an intermediate distribution frame (IDF) to facilitate the interconnection of all cables to the FAA equipment distribution frames. Cables will be provided by the ETVS contractor to interconnect the ETVS IDF to the government distribution frames. Specific interface types and descriptions are identified in appendix D of the ETVS Specification. [ETVS Specification, 7/26/94, 50.3.3.5]

6.11-6.19 Reserved

6.20 Status Assessment

The ETVS size and environmental control requirements are based on FAA facility capacities. Survey data indicated that no vendor has difficulty meeting these requirements. No physical facilities risks have been identified at this time.

Maintenance workstations will require a desktop space of 3 feet by 3 feet. Other maintenance equipment will fit in the space allotment for the central equipment rack. [ETVS Specification, 7/26/94, 150.2.3]

ETVS central equipment, including the reserve power supply, will require floor space as defined in Table 5-1, System Floor Space Allocation. [ETVS Specification, 7/26/94, 150.2.5, Table 150-1]

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6.11-6.19 Reserved

6.20 Status Assessment

The ETVS size and environmental control requirements are based on FAA facility capacities. Survey data indicated that no vendor has difficulty meeting these requirements. No physical facilities risks have been identified at this time.

for site preparation materials and equipment will require regions to submit detailed site-specific cost estimates to ANC-200 for review. Note that site preparation funds provided by ANC-200 are to be used for materials only, and not for labor. Site preparation funding is intended to cover costs of materials for items listed in Table 7-1, Intended Uses for Site Preparation Funding.

Materials Covered By ETVS Site Preparation Funding	
Console Tops	Junction Boxes
Government Intermediate Distribution Frame	Jack Panels
	Blocks
Panel Board	Cables
Conduit	Grounding Cable (to equipment)
Cable Trays	Drafting Costs (non-labor)
Circuit Breakers	One-time Electrician Costs
Power Distribution Panel	Asbestos Tile Removal/Replacement

Table 7-1 Intended Uses for Site Preparation Funding

The program office does not intend for site preparation funds be used for labor costs, grounding upgrades to facilities (e.g., ground plane installation, counterpoise), cab modernization costs (e.g., painting, carpeting, patching/grouting, air conditioning), or Telecommunications Management and Operations (TM&O) costs (e.g., circuit re termination, leased voice switch removal).

7.1.2.2 Regional Test and Evaluation Funding

ANC-200 will provide funding to the regions to cover travel and per diem expenses during Operational Test and Evaluation (OT&E)/Integration and OT&E/Operational testing on the first ETVS system at the FAA Technical Center for regional Facilities and Equipment (F&E) (AXX-45X), Sector Maintenance (SM) (AXX-46X), Air Traffic (AT) (AXX-5XX) personnel, as well as the Regional Associate Program Manager (RAPM) (AXX-42X). All other travel and per diem expenses for regional participation in test and evaluation activities will be funded by the regions.

7.1.3 AOS-200 funding

Funds provided to AOS-200, National Airway Systems Engineering Division, by ANC-200 will be used to cover travel and per diem expenses for the following activities:

- Operational Test and Evaluation (OT&E)/Integration and OT&E/Operational testing of the first ETVS system at the FAA Technical Center.
- OT&E/Integration or OT&E/Operational testing required at subsequent sites.
- Site Acceptance Testing and OT&E/Shakedown testing at the first ETVS site.
- Field Shakedown testing at subsequent sites.

7.1.4 ACN-200 funding

Funds provided to ACN-200, Voice Switch Automation Division, by ANC-200 will be used to cover travel and per diem expenses for the following test activities:

- OT&E/Integration or OT&E/Operational testing required at subsequent ETVS sites.
- Site Acceptance Testing and OT&E/Shakedown testing at the first ETVS site.
- Site Acceptance Testing and Field Shakedown testing at subsequent sites.

7.2 Facilities and Equipment (F&E) Budget

7.2.1 F&E Budget Requirements

Budget requirements for 1995 include solicitation of the ETVS Request for Proposal (RFP) to award the contract and do not have any relevance to the regions. The 1996 budget, the first to include money for the regions with regard to ETVS, is currently being presented for internal FAA approval in "Functional Working Group" meetings.

7.2.2 Summary of F&E Funding Status

No F&E funding levels have been reduced to date. ETVS F&E funding requirements, therefore, have not changed. Detailed information about ETVS funding can be obtained from ANC-200.

7.3 Operations and Maintenance (O&M) Budget

The ETVS contractor will provide all required maintenance at each site until training is available for FAA site technicians. Interim Contractor Maintenance and Logistics Support (ICMLS) services will be funded by the program office, ANC-200. FAA-performed site maintenance for the ENS will be funded using OPS dollars allocated to the regions for site maintenance activities.

The contractor will provide depot repair services for the life cycle of the ETVS. The FAA Logistics Center will be responsible for funding contractor depot repair. The level of funding required will be contractor specific and cannot be determined until award.

7.3.1 O&M Budget Requirements

The full O&M budget requirements will be determined in advance of contract award. The O&M budget requirements include a budget for depot maintenance and for stock replenishment of consumables and LRUs. Other budget requirements will be identified prior to ETVS implementation.

7.3.2 Summary of O&M Funding Status

O&M budget funding requirements will be determined prior to contract award.

7.4 Research, Engineering, and Development (RE&D) Budget

7.4.1 RE&D Budget Requirements

No budgeting will be necessary since the ETVS project is intended as an NDI procurement.

7.4.2 Summary of RE&D Funding Status

This section is not applicable to this document.

7.5-7.19 Reserved

7.20 Status Assessment

No ETVS funding risks have been identified at this time. The level of funding required will be contractor specific and cannot be determined until award of the ETVS contract.

7.2 Facilities and Equipment (F&E) Budget

7.2.1 F&E Budget Requirements

Budget requirements for 1995 include solicitation of the ETVS Request for Proposal (RFP) to award the contract and do not have any relevance to the regions. The 1996 budget, the first to include money for the regions with regard to ETVS, is currently being presented for internal FAA approval in "Functional Working Group" meetings.

7.2.2 Summary of F&E Funding Status

No F&E funding levels have been reduced to date. ETVS F&E funding requirements, therefore, have not changed. Detailed information about ETVS funding can be obtained from ANC-200.

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The ETVS contractor will provide all required maintenance at each site until training is available for FAA site technicians. Interim Contractor Maintenance and Logistics Support (ICMLS) services will be funded by the program office, ANC-200. FAA-performed site maintenance for the ENS will be funded using OPS dollars allocated to the regions for site maintenance activities.

The contractor will provide depot repair services for the life cycle of the ETVS. The FAA Logistics Center will be responsible for funding contractor depot repair. The level of funding required will be contractor specific and cannot be determined until award.

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The full O&M budget requirements will be determined in advance of contract award. The O&M budget requirements include a budget for depot maintenance and for stock replenishment of consumables and LRUs. Other budget requirements will be identified prior to ETVS implementation.

7.3.2 Summary of O&M Funding Status

O&M budget funding requirements will be determined prior to contract award.

7.4 Research, Engineering, and Development (RE&D) Budget

7.4.1 RE&D Budget Requirements

No budgeting will be necessary since the ETVS project is intended as an NDI procurement.

7.4.2 Summary of RE&D Funding Status

This section is not applicable to this document.

7.5-7.19 Reserved

7.20 Status Assessment

No ETVS funding risks have been identified at this time. The level of funding required will be contractor specific and cannot be determined until award of the ETVS contract.

8.0 HUMAN RESOURCES

8.1 Human Resource Management

8.1.1 Impacts of Acquisition on Human Resource Management

8.1.1.1 Personnel Security

No impacts on FAA personnel security are anticipated. Contractors will be required to adhere to all security policies and procedures when entering and working in FAA facilities. Detailed personnel security requirements and procedures will be identified in the contractor's Site Installation, Integration, and Acceptance Test Document (SIIATD). [ENS Data Item Description E02, 4/1/94, 10.3.1.e]

8.1.1.2 Relations With Local Communities

The implementation of the ETVS is not anticipated to affect relations with the local community.

8.1.1.3 Relations With Aviation Community

The implementation of the ETVS is not anticipated to affect relations with the aviation community.

8.1.1.4 Employee Work Environment

It is anticipated that the employee work environment will improve with implementation of the ETVS. The core and P^3I upgrades are intended to make work easier for government personnel. These features will give managers easy access to valuable information concerning controller workload and will allow a better distribution of resources in meeting air traffic control needs. [ETVS Specification, 7/26/94, 110.1, 120.1]

8.1.1.5 Employee Job Satisfaction

Elements of the ENS, including an improved Computer-Human Interface (CHI) and other new features, are anticipated to increase employee job satisfaction.

8.1.1.6 Labor-Management Relations

No impacts on labor-management relations are anticipated. The capability to make informal recordings of controller communications will not impact labor-management relations. Air Traffic supervisors currently use tapes from the legal voice recorders to assess controller performance. The presence of the supervisory recording feature will only expedite the process.

8.1.1.7 Organizational Structure(s)

No impacts on FAA organizational structures are anticipated as a result of ETVS implementation.

8.1.2 Human Resource Implementation Strategies

All currently identified potential impacts of ETVS acquisition on human resource management are positive and are expected to benefit FAA employees.

8.1.3 Security Clearances

Security Clearances will not be required for installation team members. Access to the installation facility will be required. The Technical Onsite Representative (TOR) will be responsible for providing badging and briefings for installation personnel during site installation and evaluation visits. Contractors will be required to adhere to all security policies and procedures when entering and working in FAA facilities. Detailed personnel security requirements and procedures will be identified in the contractor's Site Installation, Integration, and Acceptance Test Document (SIIATD). [ETVS Data Item Description E02, 4/1/94, 10.3.1.e, ETVS Statement of Work, 8/9/94, 3.5.3.4,]

8.2 Staffing

8.2.1 Impacts of Acquisition on Staffing

8.2.1.1 Operational Workload

Air Traffic (AT) No increase in AT operational workload is expected as a result of ETVS implementation. Installation of pre-planned product improvements, such as Communication Traffic Data (CTD) and Management Information Systems (MIS), will decrease AT supervisor workload.

Airway Facilities (AF) AF operational workload will be affected in the FAA Logistics Center, NAV/COM Support Engineering Branch, and AF Sector Maintenance. Descriptions of the changes to workload in these organizations are given below.

Depot level maintenance will be performed by the contractor for the life-cycle of the ETVS equipment will be managed by the FAA Logistics Center (FAALC). The FAALC will provide supply support by acting as a clearing house for ETVS spares. Please refer to section 10.2, Special Support Facilities, for more detail concerning depot level maintenance activities. [ETVS Statement of Work, 8/9/94, 3.6.6.4]

Second level engineering support will be accomplished by NAV/COM Support Engineering Branch, AOS-240, a tenant organization at the Aeronautical Center.

Site level maintenance will be accomplished by FAA electronic technicians experienced in switching systems and computer interfaces. Maintenance staffing levels, as derived by the Workforce Standards Analysis Branch, AFZ-200, in accordance with FAA Order 1380.40B and FAA Order 1375.4A are presented in Table 8-1, Direct Work Staffing Requirements for FAA Site Maintenance. [ETVS Integrated Logistics Support Plan, 2/18/94, 7.0]

Facility Code	Class	Type	Number of Positions	System Specialist Years/System
48BB	F	2	16	0.335
48BB	G	2	24	0.589
48BB	H	2	36	1.056
48BB	J	2	48	1.451

6/29/94

Table 8-1 Direct Work Staffing Requirements for FAA Site Maintenance

8.2.1.2 Implementation Workload

ETVS implementation will affect workload in the regions for Air Traffic (AXX-5XX), Sector Maintenance (AXX-460), Facilities and Equipment (AXX-450), and Regional Associate Program Manager (AXX-420) personnel. Increases will focus around site preparation and testing activities, as described below. Implementation related tasks for both AT and AF personnel will be determined with greater specificity after award of the ETVS contract.

Site Survey/Site Preparation Site surveys performed by the FAA will be overseen by regional F&E personnel (AXX-450). Site preparation activity following the site survey and will be overseen by regional F&E personnel. The TOR will coordinate all site survey and preparation activities and will act as liaison to the Contracting Officer's Technical Representative (COTR). Please refer to paragraph 13.2.2, Pre-Installation and Checkout Phase (Pre-INCO), and to the Generic Site Implementation Plan (GSIP) found in Appendix A.

Test and Evaluation FAA Test and Evaluation (T&E) will require participation by regional AT and AF, AOS-240, and headquarters personnel. Numbers and types of FAA personnel required to support contractor and government T&E activities are listed in Table 9-6, Personnel Requirements to Support ETVS Testing, located in section 9.4.1, Personnel Requirements.

8.2.2 Staffing Plans

Strategies to be employed to meet operational and implementation support workload requirements will be determined after award of the ETVS contract.

8.2.3 Staffing Schedule

Program schedule requirements for provision of operational and implementation staffing will be determined after award of the ETVS contract.

8.3 Training

Contractor and government representatives will participate in a Training Guidance Conference to review training task analysis, contract training plan, format for training deliverables, schedules, training locations, Commercial-Off-The-Shelf (COTS)/Non-Developmental Item (NDI) training materials, and FAA-STD-028B, Contract Training Programs, requirements. [ETVS Statement of Work, 8/9/94, 3.7.1, 3.7.6.1]

8.3.1 Training Program

ENS training will be provided to Air Traffic, Airway Facilities, and FAALC/AOS-240 personnel. AT training will include operator/supervisor training. AF training will involve orientation and hardware maintenance courses. Engineering support services training will be offered to FAALC/AOS-240 personnel in the event that the FAA assumes depot level repair responsibilities for the ETVS. [ETVS Statement of Work, 8/9/94, 3.7.2; ETVS Integrated Logistics Support Plan, 2/18/94, 6.0]

8.3.1.1 ETVS Orientation Course

The ETVS Orientation Course will provide an overview of the system, contractor installation and testing procedures, site operator responsibilities, and site maintenance personnel responsibilities. This orientation course is intended for personnel involved contractor Site Acceptance Testing, and FAA Operational Test and Evaluation (OT&E) Integration, Operational, and Shakedown testing. Government Technical Onsite Representatives (TORs) will also attend the ETVS Orientation Course. As ordered by the government, ETVS Orientation Courses will be conducted by the contractor at the contractor's facility or at a government facility. [ETVS Statement of Work, 8/9/94, 3.7.2, 3.7.7.1]

8.3.1.2 ETVS Operator/Supervisor Course

The ETVS Operator/Supervisor course, intended as a "train-the-trainer" course, will provide detailed instruction, including hands-on training, regarding operation of the ETVS. It is intended for a cadre of FAA Academy cadre personnel who will provide operator training. The ETVS Operator/Supervisor course will be conducted by the contractor at the contractor's facility. [ETVS Statement of Work, 8/9/94, 3.7.2, 3.7.7.1]

8.3.1.3 ETVS Hardware Maintenance *Course*

The ETVS Hardware Maintenance Course will provide detailed technical instruction, including hands-on training, regarding site maintenance. AF training will be a prerequisite course for the Engineering Support Services Course. ETVS Hardware Maintenance Courses will be conducted by the contractor at the contractors facility or at a government facility as ordered by the government. [ETVS Statement of Work, 8/9/94, 3.7.2, 3.7.7.1]

Test and Evaluation FAA Test and Evaluation (T&E) will require participation by regional AT and AF, AOS-240, and headquarters personnel. Numbers and types of FAA personnel required to support contractor and government T&E activities are listed in Table 9-6, Personnel Requirements to Support ETVS Testing, located in section 9.4.1, Personnel Requirements.

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ENS training will be provided to Air Traffic, Airway Facilities, and FAALC/AOS-240 personnel. AT training will include operator/supervisor training. AF training will involve orientation and hardware maintenance courses. Engineering support services training will be offered to FAALC/AOS-240 personnel in the event that the FAA assumes depot level repair responsibilities for the ETVS. [ETVS Statement of Work, 8/9/94, 3.7.2; ETVS Integrated Logistics Support Plan, 2/18/94, 6.0]

8.3.1.1 ETVS Orientation Course

The ETVS Orientation Course will provide an overview of the system, contractor installation and testing procedures, site operator responsibilities, and site maintenance personnel responsibilities. This orientation course is intended for personnel involved contractor Site Acceptance Testing, and FAA Operational Test and Evaluation (OT&E) Integration, Operational, and Shakedown testing. Government Technical Onsite Representatives (TORs) will also attend the ETVS Orientation Course. As ordered by the government, ETVS Orientation Courses will be conducted by the contractor at the contractor's facility or at a government facility. [ETVS Statement of Work, 8/9/94, 3.7.2, 3.7.7.1]

8.3.1.2 ETVS Operator/Supervisor Course

The ETVS Operator/Supervisor course, intended as a "train-the-trainer" course, will provide detailed instruction, including hands-on training, regarding operation of the ETVS. It is intended for a cadre of FAA Academy cadre personnel who will provide operator training. The ETVS Operator/Supervisor course will be conducted by the contractor at the contractor's facility. [ETVS Statement of Work, 8/9/94, 3.7.2, 3.7.7.1]

8.3.1.3 ETVS Hardware Maintenance *Course*

The ETVS Hardware Maintenance Course will provide detailed technical instruction, including hands-on training, regarding site maintenance. AF training will be a prerequisite course for the Engineering Support Services Course. ETVS Hardware Maintenance Courses will be conducted by the contractor at the contractors facility or at a government facility as ordered by the government. [ETVS Statement of Work, 8/9/94, 3.7.2, 3.7.7.1]

8.3.5 Training Schedule

Air Traffic training schedules will be determined by ATZ-110, Air Traffic Training Requirements Program, Advanced Systems, after contract award. Airway Facilities training schedules will be developed by AFZ-100, Airway Facility Training Program Division, after contract award.

8.4-8.19 Reserved

8.20 Status Assessment

No risks associated with human resources have been identified to date. Human resources information is not yet available for some areas covered in this section. Detailed information concerning implementation workload, staffing plans and schedules, and training schedules and quotas will be dependent on the final number, location, and delivery schedule of sites designated to receive ETVS equipment. Human resource management will be addressed more completely in the Human Resource Management Plan being developed at this time.

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9.0 TEST AND EVALUATION

9.1 Overview of Test Program

The ETVS test program will be comprised of contractor performed developmental and production testing and government performed operational testing. The P3I implementation approach for the ETVS program will require testing of the initial "core requirements" ETVS systems and on the P3I subsystems and interrelated core ETVS systems at a later date. The first ETVS system produced, the "core requirements" ETVS, will undergo extensive developmental, production, and operational testing at the factory, FAA Technical Center, and first (or other designated key) site. Subsequent core requirements ETVS systems will undergo abridged production, developmental, and operational testing. Figure 9-1 depicts a summary of core requirements testing for the ETVS.

Several subsystems of the ETVS, including the Communications Traffic Data (CTD), Management Information System (MIS), Remote Monitoring Subsystem (RMS), and digital ground-to-ground interfaces, are expected to be implemented via a P3I program. If one or more of these systems are available from the vendor with the first production core ETVS they will be tested at the First Article Test. Because no contractor is expected to be capable of meeting all ETVS requirements, some normal P3I developmental effort will be necessary for the contractor to meet the exact requirements of the ETVS specification.

Each subsystem integrated into the ETVS will change the baseline system. The P3I program will be implemented over an extended period of time and on an as ordered basis. Each P3I subsystem ordered will undergo a stand alone test program categorized into unit, subsystem, and integration testing to ensure a smooth transition when P3I subsystems are being retrofitted into fielded switches. The amount of testing required and the level at which testing occurs will depend on the degree of development required for the subsystem, and the degree of integration required with the baseline ETVS. Once the core requirements ETVS is upgraded with the P3I subsystem (called "upgraded ETVS"), it will undergo system, production, and operational testing. The second and subsequent upgraded ETVS switches will undergo production, developmental, installation, and operational testing as required. Figure 9-2 depicts a summary of testing for upgraded ETVS systems.

9.1.1 Government Test Program

The government test program will involve operational testing of the first production core requirements ETVS, second and subsequent core requirements ETVS switches, and initial P3I subsystems and associated core requirements ETVS switches. Government operational testing will occur serially from Integration to Operational, to Shakedown testing. Descriptions of operational testing are given below.

9.1.1.1 Operational Test and Evaluation (OT&E)/Integration Test

OT&E/Integration testing will verify the NAS end-to-end performance as defined by the system and subsystem level requirements in NAS-SS-1000, and will ensure that the ETVS does not adversely affect performance in the NAS. This testing will examine the interface between the ETVS and the NAS environment in which it will operate. NAS-SS-1000 requirements affected by changes to the core ENS system with the addition of the P3I subsystem will be investigated. OT&E/Integration testing will be conducted by ACN-200 on the first system at the FAA Technical Center (FAATC). Some testing at subsequent sites may be required if any interface at a specific site is different from those found at the Technical Center.

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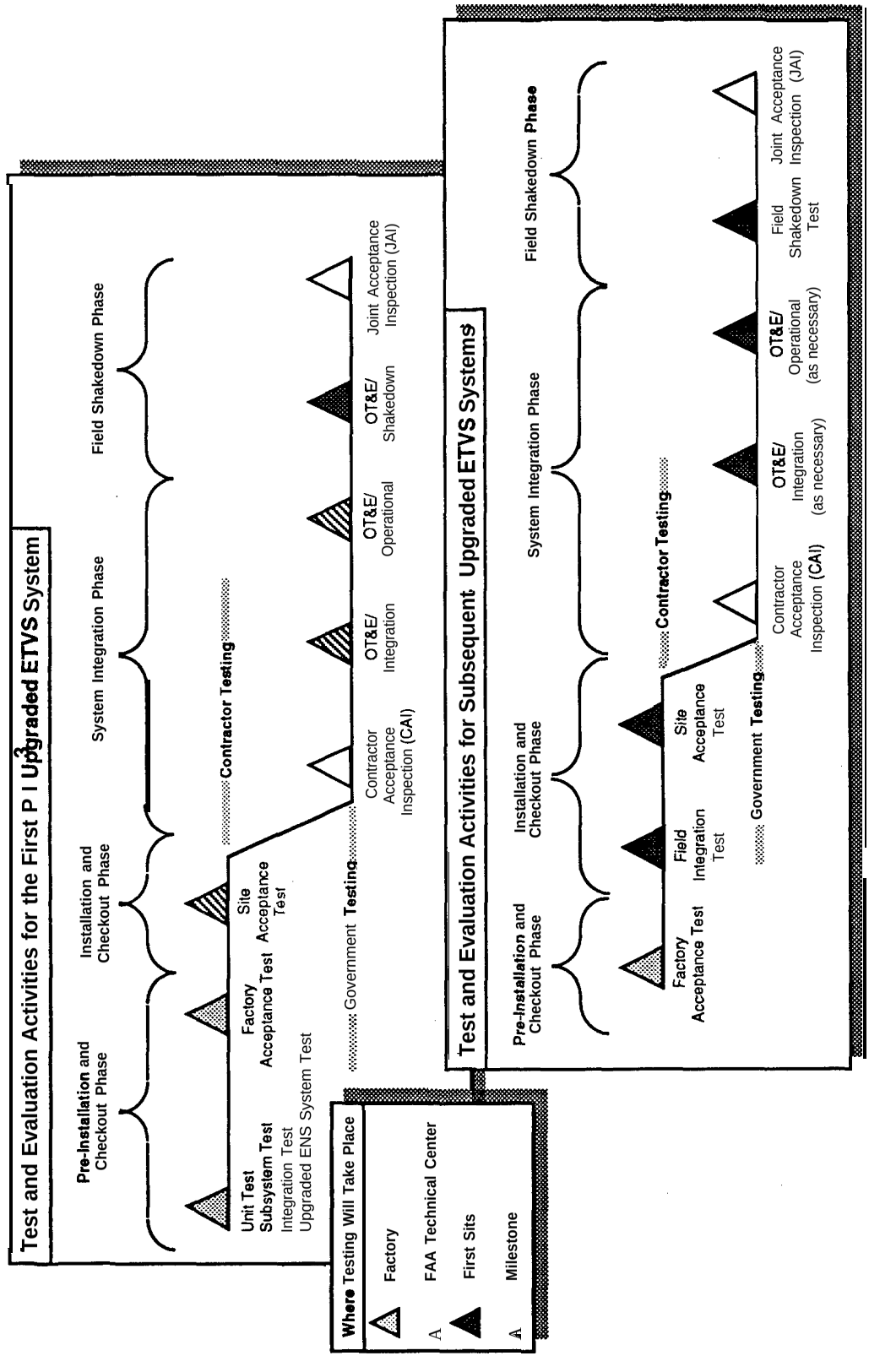

Figure 9-2 Test and Evaluation Activities for P3I Upgraded ETVS Systems

9.1.1.2 OT&E/Operational Test

OT&E/Operational testing, conducted on the first system by ACN-200 at the Technical Center, will verify the operational effectiveness and user suitability of the ETVS. This testing will be conducted in a realistic environment to ensure that the core requirements or P3I upgraded ENS can be operated effectively by Air Traffic (AT) personnel in the tower and TRACON environments. If site configurations substantially different from those that can be emulated at the Technical Center are found, OT&E/Operational testing may be conducted at subsequent sites.

9.1.1.3 OT&E/Shakedown Test

OT&E/Shakedown testing will be similar to the OT&E/Operational test, but will be conducted at the first field site to verify the overall functionality of the ETVS and its supporting elements. Testing will verify both AT operational and AF supportability and maintainability procedures. Field Shakedown testing, similar to the OT&E/Shakedown test conducted on the first ETVS system, will be conducted at all subsequent sites.

9.1.2 Contractor Test Program

The contractor test program will involve developmental and production testing of all core requirements and P3I subsystems. The Developmental Test and Evaluation (DT&E) program for the P3I subsystems is intended to ensure that each subsystem developed meets all of the specification requirements and that these subsystems can be integrated successfully into the ETVS baseline. A secondary objective of this DT&E is to verity that fielded ETVSs can be successfully retrofitted with P3I subsystems and that the final fielded system meets all the requirements of the baselined ENS system. The benchmark for determining a successful DT&E program will be a baseline ENS containing the P3I subsystem that meets all of the specified requirements. Complete descriptions of each type of ETVS developmental and production testing are given below.

9.1.2.1 Core Requirements ETVS

First Article Test The First Article Test (FAT), performed on the first production core ETVS only, will be a comprehensive verification of the ETVS design. This will be accomplished at the contractor's facility, and will use contractor supplied personnel, test equipment, test jigs, interface equipment, and any simulator subsystems required. The First Article Test procedures will be developed by the contractor and approved by ANC-200. ETVS specification requirements to be tested will include functional, physical, performance, and interface requirements, as well as compliance with industry standards.

Production Acceptance Test and Evaluation (PAT&E) The Production Acceptance Test (PAT), also known as the Factory Acceptance Test, will be performed on all core ETVS systems. The PAT will test critical functional and performance parameters selected from the First Article Test. The first core ETVS will undergo a First Article Test, followed by a PAT to verify PAT procedures. Follow-on ETVS systems will undergo only the PAT to verify aspects of the system that could possibly be affected by the production process. Critical criteria looked at by the PAT include parameters affected by the selection of components, production process, or variance in system architecture.

Installation Test and Evaluation The Installation Test, performed on all core ETVS systems, will take place at each site after installation. Contractor installation testing will ensure successful integration of the ETVS into the facility. A government witnessed Site Acceptance Test will ensure that the ETVS meets the specific functional and performance requirements particular to each site.

9.1.2.2 First P3I Subsystem and Associated Core Requirements ETVS

Design Review Each P3I will undergo a design review cycle to ensure the contractor understands the requirement and has a plan for design and implementation that meets the expectations of the government. Preliminary and critical design reviews will be held as necessary at the contractor's facility to expedite the design process.

Unit Testing Each subsystem under development will subdivide into units of software and hardware. These units will be tested to ensure the function provides the proper inputs and outputs to other cooperating units. In addition, any unit changes required in the baseline ETVS will be developed and tested during this phase of testing. Unit testing will be conducted at the contractors facility and may be witnessed by authorized government representatives as required. Results of unit tests will be provided to the government in activity reports.

Subsystem Testing The integrated P3I units will form the subsystem being purchased. Subsystem testing will ensure the subsystem meets the expected input and output parameters specified. Any modifications to the ETVS baseline requiring subsystem testing will also be verified during this phase of testing. The subsystem will be tested in the contractor's facility using contractor provided personnel, test equipment, test jigs, and any input or output test collection or stimulus devices required. This testing will follow a contractor developed and government approved procedure. The test may be witnessed by the government and the contractor will be required to submit results for review.

Integration Testing The final integration of the P3I subsystem and the ETVS subsystem will require integration testing to ensure the two subsystems can function together. Integration testing will also ensure that the interface meets the requirements of any interface requirements documents and interface control documents. Integration testing will require the base ENS and resulting end system to undergo a series of tests to ensure the functional and performance attributes of the system remain within specified tolerances. This testing will take place at the contractor's facility and will be witnessed by the government. The acceptance of results from this testing will constitute the acceptance of the P3I subsystem.

Upgraded ETVS System Test After the ETVS-P3I interface has undergone successful integration testing, the combined unit will undergo integration testing and system testing. This testing will assure the FAA that the resulting baseline system performs and functions in accordance with the specification. After a system wide P3I has been implemented in the ETVS, a new baseline will be established and the process will be repeated for each system wide P3I ordered. It is probable that some P3I will not result in a system wide baseline change. While this will create different baselines for different applications, it will have little affect on the testing required to ensure proper integration of P3I.

Production Acceptance Test and Evaluation (PAT&E) The Production Acceptance Test (PAT), also known as the Factory Acceptance Test, will consist of critical functional and performance parameters selected from the upgraded ETVS System Test. The P3I ETVS will undergo a System Test, followed by a PAT to verify PAT procedures. Follow-on upgraded ETVS systems will undergo only the PAT to verify aspects of the system that could possibly be affected by the production process. Critical criteria looked at by the PAT include parameters affected by the selection of components, production process, or variance in system architecture.

Installation Testing and Site Acceptance Test Retrofitting fielded systems with an upgrade will require that a combination of integration and installation testing be performed on the fielded system. The contractor will be required to install the upgrade, verify the upgrade operates in accordance with the requirements, and verify the upgraded system operates in accordance with its performance parameters. This will require the contractor to perform integration testing on site. In addition, the newly upgraded system will be subjected to a comprehensive acceptance test addressing all requirements inclusive of the baseline ETVS and the upgrade P3I subsystem. Each site may require specific tailoring of the installation and acceptance plan to accommodate the requirements of the site.

9.1.2.3 Second and Subsequent P3I Subsystem and Associated Core Requirements ETVS

Production Acceptance Test and Evaluation (PAT&E) The Production Acceptance Test (PAT) will consist of a subset of critical functional and performance parameters tested during the upgraded ETVS System Test. Follow-on upgraded ETVS systems will undergo the PAT to verify aspects of the system

Unit Testing Each subsystem under development will subdivide into units of software and hardware. These units will be tested to ensure the function provides the proper inputs and outputs to other cooperating units. In addition, any unit changes required in the baseline ETVS will be developed and tested during this phase of testing. Unit testing will be conducted at the contractors facility and may be witnessed by authorized government representatives as required. Results of unit tests will be provided to the government in activity reports.

Subsystem Testing The integrated P3I units will form the subsystem being purchased. Subsystem testing will ensure the subsystem meets the expected input and output parameters specified. Any modifications to the ETVS baseline requiring subsystem testing will also be verified during this phase of testing. The subsystem will be tested in the contractor's facility using contractor provided personnel, test equipment, test jigs, and any input or output test collection or stimulus devices required. This testing will follow a contractor developed and government approved procedure. The test may be witnessed by the government and the contractor will be required to submit results for review.

Integration Testing The final integration of the P3I subsystem and the ETVS subsystem will require integration testing to ensure the two subsystems can function together. Integration testing will also ensure that the interface meets the requirements of any interface requirements documents and interface control documents. Integration testing will require the base ENS and resulting end system to undergo a series of tests to ensure the functional and performance attributes of the system remain within specified tolerances. This testing will take place at the contractor's facility and will be witnessed by the government. The acceptance of results from this testing will constitute the acceptance of the P3I subsystem.

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9.1.2.3 Second and Subsequent P3I Subsystem and Associated Core Requirements ETVS

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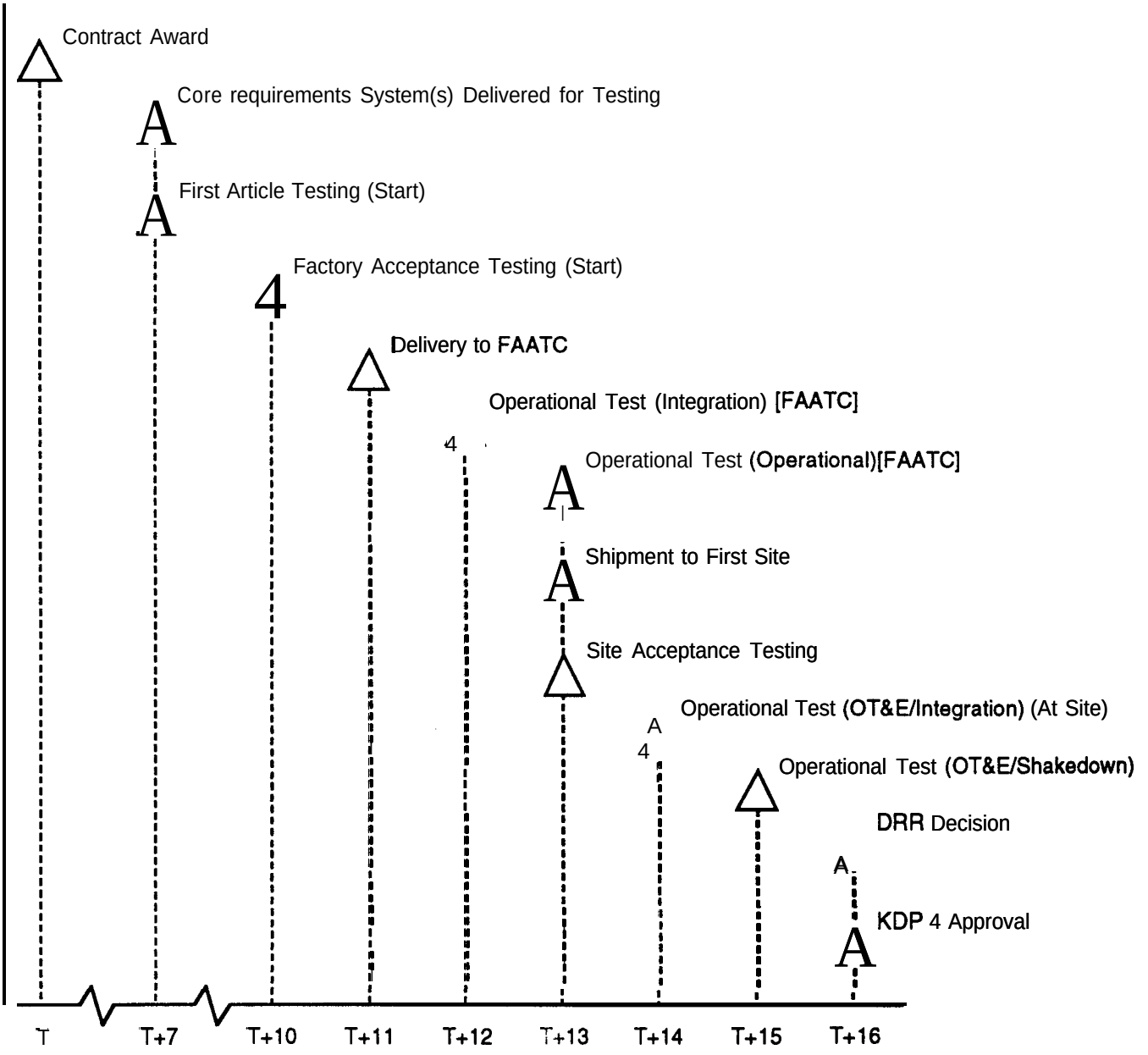

Figure 9-3 ETVS Test & Evaluation Schedule

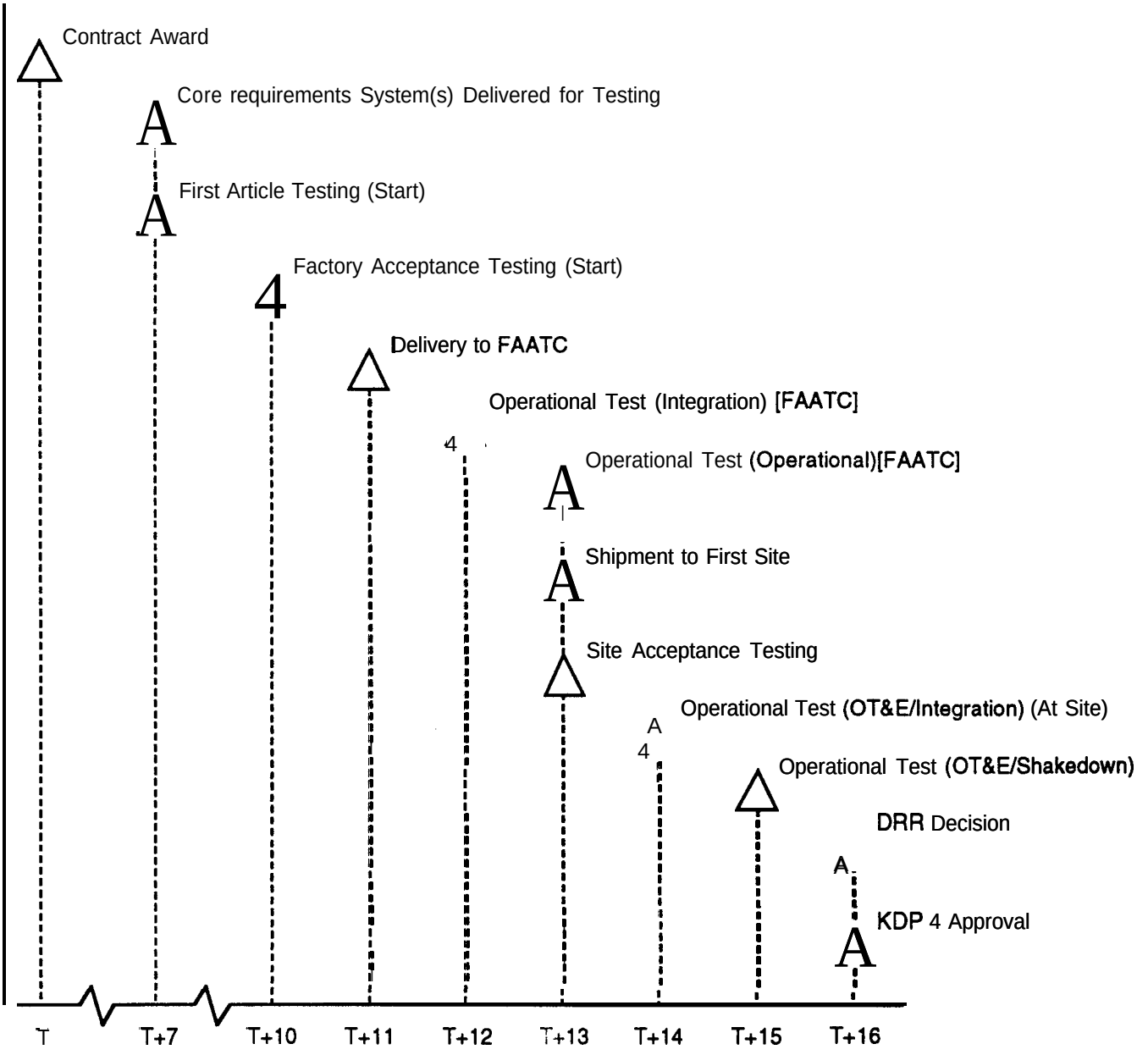

Figure 9-3 ETVS Test & Evaluation Schedule

ETVS Test & Evaluation Responsibilities
First P3I Modified ETVS

Site Implementation Phase	Test Performed	Where	By Whom
Pre-Installation and Checkout	Unit Testing	Contractor Facility	Contractor
	Subsystem Testing	Contractor Facility	Contractor
	Integration Testing	Contractor Facility	Contractor
	System Test	Contractor Facility	Contractor
	Factory Acceptance Test	Contractor Facility	Contractor
Installation and Checkout	Site Acceptance Test	FAA Technical Center	ACN-200
System Integration	OT&E/Integration	FAA Technical Center	ACN-200
	OT&E/Operational	FAA Technical Center	ACN-200
Field Shakedown	Field Shakedown Test	First Site	AOS-240

Table *9-3* T&E Responsibilities *for the First P3I Upgraded ETVS*

ETVS Test & Evaluation Responsibilities
Second and Subsequent P3I Modified ETVS

Site Implementation Phase	Test Performed	Where	By Whom
Pre-Installation and Checkout	Factory Acceptance Test	Contractor Facility	Contractor
Installation and Checkout	Field Integration Test	First Site	Contractor
	Site Acceptance Test	First Site	Contractor
System Integration	OT&E/Integration (As Necessary)	First Site	ACN-200
	OT&E/Operational (As Necessary)	First Site	ACN-200
Field Shakedown	Field Shakedown Test	First Site	AOS-240

Table 9-4 T&E Responsibilities for Subsequent P3I Upgraded ETVSs

Descriptions of the roles and responsibilities of each organization involved in test and evaluation activities are given below.

9.3.1.1 Voice Switching and Recording Program Manager (PM)

The FAA program manager (PM) is responsible for the overall management of the project. Responsibilities related to the test program include arranging for T&E support from the associate program manager for test (APMT), joint preparation of the test and evaluation master plan, obtaining approval from the Test Policy Review Committee (TPRC) for the test program and approval of budgets **to fund** T&E activities. In addition, the PM is responsible for monitoring test activities through deployment readiness review (DRR).

9.3.1.2 Associate Program Manager for Test (APMT)

The associate program manager for test, assigned from the FAA Technical Center (FAATC), Voice Switch Automation Division, is responsible for supporting the PM in all test related matters. As the PM agent for T&E, the APMT is responsible for managing the overall test and evaluation program including maintenance of the test schedule, coordination of tests, and ensuring that all test requirements are met. The APMT is responsible for co-authoring and implementing the test program prescribed by the ETVS TEMP. Responsibilities related to implementing the test program include monitoring the selected contractor's testing, developing and implementing the Operational Test and Evaluation (OT&E)/Integration and OT&E/Operational test phases, monitoring the OT&E/Shakedown testing, and making recommendations to the PM and DRR Executive Committee (DRR/EXCOM).

9.3.1.3 Associate Program Manager for Engineering (APME)

The APME, ANC-600, Voice Switching and Recording Engineering Division, supports the PM in all engineering related activities. The APME is responsible for developing the specifications which define the ETVS. The APME will review test plans, procedures and test reports. In addition, the APME will witness all test activities.

9.3.1.4 Associate Program Manager for Quality (APMQ) [ASU-424]

The APMQ, ASU-424, Quality Assurance Branch, supports the PM for all quality related activities. The primary responsibility of the APMQ is to monitor the contractor production facilities to ensure compliance with FAA quality standards (FAA-STD-013B and FAA-STD-016). The APMQ will monitor all contractor test activities, and is responsible for monitoring production acceptance testing in particular.

9.3.1.5 Associate Program Manager for System Engineering (APMSE)

The APMSE, ASE-200, Communications System Engineering Division, supports the PM in all system engineering related activities. The APMSE is responsible for configuration management for the NAS level system requirements and providing the NAS level OT&E/ Integration test requirements from the system requirements. The APMSE is also responsible for developing, in conjunction with user organizations (air traffic and airway facilities), the Operational Requirements Document (ORD), which in turn provides operational characteristics and issues on which the operational test program is based.

9.3.1.6 Associate Program Manager for Requirements (APMR)

The APMR, ATR-120.1, Terminal Procedures Branch, supports the PM in all requirements related activities. The APMR provides the requirements on which the ETVS program is based. APMR responsibilities related to test include providing user requirements for the TEMP, monitoring all DT&E/PAT&E activities, participating in the development and implementation of the operational test program, and managing the participation of regional air traffic (AT) and airway facilities (AF) personnel in operational testing. The APMR will also review all plans, procedures and reports related to operational testing.

9.3.1.7 Navaids/Communications Support Engineering Branch

AOS-240, NAV/COM Support Engineering Branch, is responsible for developing and implementing the OT&E/Shakedown test program. AOS-240 will develop, in coordination with air traffic service (ATR) and airway facilities, shakedown test plans, procedures, and after the conduct of the shakedown test, the test report. AOS-240 will provide a deployment recommendation to the DRR/EXCOM based the results of shakedown testing. They may also participate in any follow-on field shakedown testing required.

9.3.1.8 Office of Independent Operational Test and Evaluation Oversight (IOT&E)

ATQ will assess compliance with the system requirements statement and operational readiness criteria. The office of IOT&E will independently asses the operational effectiveness and suitability of the ETVS,

based on the results of DT&E and OT&E, and will report those results directly to the administrator and the acquisition review committee. The off ice of IOT&E is a member of the Test Policy Review Committee (TPRC) for level I MA systems. In addition to providing an independent operational assessment based on test. results, IOT&E will also review the TEMP and any other test planning and reporting documentation required.

9.3.1.9 Department of Defense Program Office

The DoD program office will coordinate with the FAA on all DoD specific requirements of the ETVS. A representative of the DoD program office will be a member of the TPRC and will review all test documentation to assure that DoD critical T&E concerns have been addressed.

9.3.1.10 Engineering Specialties and Configuration Management

The Engineering Specialties and Configuration Management Division, ASE-600, is responsible for reviewing the test and evaluation master plan. ASE-600 will also act as the TPRC Secretariat, planning and scheduling all TPRC meetings.

9.3.1.11 Test Policy Review Committee

The Test Policy Review Committee (TPRC) is comprised of senior managers from various FAA organizations who have responsibility with regard to the promulgation of FAA NAS Test and Evaluation (T&E) policy. It supports T&E policy, standards, and definitions by providing management oversight into the accountability and compliance of participants in the T&E program. The TPRC approves the Test and Evaluation Master Plan (TEMP) and all test policy waivers. The TPRC approves revisions to TEMPs, and also resolves T&E issues that can't be resolved at lower levels. The TPRC will be secretaried by ASE-600. Membership will include the organizations listed in Table 9-5, ETVS Test Policy Review Committee (TPRC) Membership. [FAA Order 1810.4B, 11.a, 11.b, part 2 /80, part 3 /1.a]

ETVS Test Policy Review Committee (TPRC)

Position	Routing Symbol	Office
Secretariat	ASE-600	Engineering Specialities and Configuration Management
Member	ANC-1	Communications and Aircraft Acquisition
Member	ASE-11	NAS Systems Engineering Service
Member	ANS-1	NAS Transition and Implementation Service
Member	AND-1	Associate Administrator for NAS Development
Member	AND-3	Special Assistant to AA for NAS Development (AND-l)
Member	ATR-1	Air Traffic Plans and Requirements Service
Member	ALM-1	Requirements and Life Cycle Management
Member	AFS-1	Flight Standards Service
Member	ACW-1	Engineering, Integration, and Operational Evaluation Service
Member	FAA/DoD JPCO	DOD/Joint Program Coordination Office

Table 9-5 ETVS Test Policy Review Committee (TPRC) Membership

9.3.2 Contractor Test Organization

The organizational structure, including key technical and management personnel, that will support the **conduct of the** contractor test program will be identified in the contractor's Site Installation Management Plan and will be summarized in subsequent PIP revisions. [ETVS Data Item Description E01, 4/1/94, 10.2]

based on the results of DT&E and OT&E, and will report those results directly to the administrator and the acquisition review committee. The off ice of IOT&E is a member of the Test Policy Review Committee (TPRC) for level I MA systems. In addition to providing an independent operational assessment based on test. results, IOT&E will also review the TEMP and any other test planning and reporting documentation required.

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ETVS Test Policy Review Committee (TPRC)

Position	Routing Symbol	Office
Secretariat	ASE-600	Engineering Specialities and Configuration Management
Member	ANC-1	Communications and Aircraft Acquisition
Member	ASE-11	NAS Systems Engineering Service
Member	ANS-1	NAS Transition and Implementation Service
Member	AND-1	Associate Administrator for NAS Development
Member	AND-3	Special Assistant to AA for NAS Development (AND-l)
Member	ATR-1	Air Traffic Plans and Requirements Service
Member	ALM-1	Requirements and Life Cycle Management
Member	AFS-1	Flight Standards Service
Member	ACW-1	Engineering, Integration, and Operational Evaluation Service
Member	FAA/DoD JPCO	DOD/Joint Program Coordination Office

Table 9-5 ETVS Test Policy Review Committee (TPRC) Membership

9.3.2 Contractor Test Organization

The organizational structure, including key technical and management personnel, that will support the **conduct of the** contractor test program will be identified in the contractor's Site installation Management Plan and will be summarized in subsequent PIP revisions. [ETVS Data Item Description E01, 4/1/94, 10.2]

Personnel Requirements to Support ETVS Testing

T&E Participant \ Test Phase	Contractor Installation/Site Acceptance Test	OT&E/Integration OT&E/Operational	OT&E/ Shakedown	Field Shakedown
ACN-200	2	5	2	—
ANC-200	1	1	1	—
AOS-240	1*	1	5	2
Regional APM (420)	1*	1	1	—
Regional F&E (450)	2	2	3	—
Regional SFO (SM)	1	1	1	2
Regional AT (5XX)	0	2	3	1

* AOS-240 personnel and RAPM are not required to support Installation and Site Accpeptance Testing activities.

Table *9-6 Personnel Requirements to Support ETVS Testing*

9.5.3 Discrepancy Correction Process

Where the contractor has obtained test results that do not indicate verification of requirements, the contractor will log the discrepancy in accordance with the Test Procedures DID, ETVS-C02. The contractor will determine the cause for the noncompliance and report it to the government prior to submission for retest. All corrective action will be the responsibility of the contractor. On any retest, the contractor will be responsible for identifying the cause of the problem, identifying a solution to the problem, and proposing the fix to the government. In addition, the contractor will be responsible for identifying any other ETVS subsystems affected by the problem or the proposed solution. The government will approve all corrective action before it is taken, and all corrective action will be completed prior to submission for retest. The retest will be conducted in accordance with the original test procedure or as approved by the government. [ETVS Statement of Work, 8/9/94, 3.4.1.5]

9.6-9.19 Reserved

9.20 Status Assessment

No test and evaluation risks have been identified at this time.

Maintenance tasks to be performed by the technician will be restricted to those tasks required to accomplish on-site preventive and corrective maintenance tasks. No LRU repair will take place below depot level. The FAALC will ship a serviceable LRU to the ETVS site upon request. Failed LRUs will be shipped by the site to the FAALC, and failed LRUs that are non-expendable items will be shipped to the contractor for repair.

At the end of the Contractor Repair Service (CRS) contract, the FAA Logistics Center (FAALC) will be responsible for providing depot level support until the ETVS is replaced. There is no schedule at this time for transitioning depot level repair from the contractor to the FAALC. Details of the hardware maintenance concept are contained in the ETVS Integrated Logistics Support Plan and the ETVS Maintenance Requirement Document.

10.1.2 Software

Software maintenance will be performed by the contractor, with National Airway Systems Engineering Division, AOS-200, involvement for the life cycle of the ETVS equipment. [ETVS Statement of Work, 8/9/94, 3.6.6.4.2]

10.2 Special Support Facilities

No special requirements for government support facilities have been identified. All depot level maintenance for the ETVS will be performed by the contractor at the contractor's facility. No changes to government facilities are anticipated unless the government chooses to assume depot level maintenance on the ETVS. Site maintenance activities will be accomplished by the contractor until training is in place for FAA AF sector maintenance technicians and technical instruction books for ETVS equipment are received from the contractor. After FAA technicians are trained and the instruction books are available, the government will assume site maintenance activities. No special support facilities, however, will be required by the site maintenance technicians to accomplish ETVS site maintenance. [ETVS Statement of Work, 8/9/94, 3.6.6.4; ETVS Integrated Logistics Support Plan, 2/18/94, 8.2]

10.2.1 Mike Monroney Aeronautical Center

10.2.1.1 Restoration Response Level

This section is not applicable to this document.

10.2.1.2 Field Level Maintenance

This section is not applicable to this document.

10.2.1.3 Depot Level Maintenance

Depot level maintenance will be performed by the contractor for the duration of the contract. Contractor repair service will be managed by the FAA Logistics Center (FAALC). The FAALC will provide supply support for ETVS sites. This involves acting as a clearinghouse for ETVS spares. ETVS sites will send failed LRUs to the FAALC and will receive a replacement LRU from Depot stock. The FAALC will forward the failed LRU from the site to the contractor for repair. The contractor will repair LRUs and return them to the FAALC, where they will be returned to stock. [ETVS Statement of Work, 8/9/94, 3.6.6.4]

10.2.1.4 Engineering Support

Second level engineering support will be accomplished by AOS-240, NAV/COM Support Engineering Branch, a tenant organization at the Aeronautical center.

10.2.2 FAA Technical Center

This section is not applicable to this document. The FAA Technical Center will not perform system support activities for the ETVS program.

10.3 Materiel Support

10.3.1 Project Materiel

The FAA Logistics Center (FAALC) will provide supply support for the ETVS project. They will act as a middle man between the sites and the contractor's depot level repair facility to expedite handling of any failed ETVS LRUs. They will also act as a distribution center for ETVS site spares, re supplying site stock as it is depleted. The contractor will provide depot level repair maintenance on hardware, firmware, and software components for the duration of the contract. [ETVS Statement of Work, 8/9/94, 3.6.6.4]

10.3.2 Provisions and Supply Support

The initial stock of spare and repair parts for both sites and the FAA Logistics Center (FAALC) will be funded by the ETVS program office, ANC-200. A Provisioning Conference will be held after the system has been baselined. During the Provisioning Conference, all LRUs that are candidates for FAA Logistics Center (FAALC) storage will be identified. A consolidated list of all spares requirements will then be provided by the Program Office for provisioning. [ETVS Statement of Work, 8/9/94, 3.6.3.4]

The contractor will provide a copy of the recommended site specific spares list as an appendix to the Site Installation, Integration, and Acceptance Test Document (SIIATD). ALM-700, Communications Life-Cycle Division in concert with the contractor will determine the candidate LRUs and quantities for stocking at individual sites. These site spares will be delivered to the site with the ETVS equipment. [ENS Statement of Work, 8/9/94, 3.5.1.2, 3.6.3.3]

10.3.3 Packaging, Transportation, and Storage

All ETVS equipment and spares delivered to sites will be packaged and marked in accordance with ASTM-D-3951, MIL-STD-2073-1, and MIL-STD-129. ETVS equipment and components shipped to the FAA Logistics Center (FAALC) for storage will be individually packaged. Common hardware items will be packed in multiple unit pack quantities as supplied through retail trade channels. A more detailed description of packaging requirements can be found in Section D, Packaging and Marking, of the ETVS contract. Failed LRUs shipped from the site to the FAALC will be packed in the container used to ship the replacement LRU from the FAALC to the site. The FAALC will use reusable containers to pack and ship Exchange and Repair (E&R) items to the contractor for repair.

All materials to be stored at the FAALC will be handled and marked according to MIL-STD-129L. The exterior shipping container will also be marked with the serial number, part number, warranty expiration date, contract number, and contract line item number.

The FAALC, ETVS site personnel, and the contractor will use established FAA guidelines for shipping and transporting ETVS material by the most economical means available. [ETVS Statement of Work, 8/9/94, 3.5.3.1; ETVS Integrated Logistics Support Plan, 2/18/94, 9.1, 9.2]

The contractor's Site Installation, Integration, and Acceptance Test Document (SIIATD) will include site specific instructions for unpacking, handling, and inventorying ETVS equipment. The SIIATD will also include instructions for disposal of packing and other waste material. [ETVS Data Item Description E02, 4/1/94, 10.3.2.c]

10.4 Technical Documentation

10.4.1 Hardware Documentation

No design documentation will be provided with the ETVS other than the System Requirement Allocation Document (SRAD). The SRAD will demonstrate the system's compliance with the ENS specification by describing the specific characteristics of subsystems or components that will be relied upon to meet each specification requirement. A single unbound, camera ready reproducibility quality copy of the SRAD will be delivered to ANC-600, Voice Switching and Recording Engineering Division. No magnetic copy will be required. The SRAD will be reviewed for completeness and accuracy by ANC-600, ASU-330, ASE-3.2, ACN-200, AOS-240, and ESC/TGN. [ETVS Data Item Description B08, 4/1/94, 3.1; ETVS CDRL B08, 4/1/94]

A complete set of technical data documentation, including proprietary data, will be placed with a third party escrow agent in the event that the government assumes responsibility for maintenance level repair of the ETVS. [ETVS Statement of Work, 8/9/94, 3.6.7]

10.4.2 Software Documentation

No proprietary software documentation will be provided with the ETVS. The contractor will deliver a firmware support manual as ordered by the government. This manual will provide information necessary to program and reprogram firmware used for unique position configuration data storage. A single unbound, camera ready reproducibility quality copy of the firmware support manual will be delivered to ANC-600, Voice Switching and Recording Engineering Division. A magnetic copy will be delivered to ANC-600 on a 3.5" or 5.25" DOS-compatible floppy disk in ASCII format. The firmware support manual will be reviewed for completeness and accuracy by ANC-600, ASU-330, AOS-240, AMA-433, AML-130, and ESC/TGN. [ETVS Statement of Work, 8/9/94, 3.6.5.2; ETVS CDRL F07, 4/1/94]

10.4.3 Procedural Documentation

The contractor will supply a technical instruction book to support system installation, troubleshooting, and site maintenance. The technical instruction book will document complete installation, operation, and site maintenance of all ETVS hardware, software, and firmware, and will include a level of detail that will provide a thorough understanding of all ETVS functions. The manual will allow an ETVS technician to isolate the failure to the LRU level. A single unbound, camera ready reproducibility quality copy of the technical instruction book will be delivered to AOS-240, Navaids/Communications Support Engineering Branch. Two magnetic copies will be delivered to AOS-240 on a 3.5" or 5.25" DOS-compatible floppy disk. One of the magnetic copies will be in ASCII format, the other will be in Word Perfect 5.1 and AutoCAD12 format. The technical instruction book will be reviewed for completeness and accuracy by ANC-600, ASU-330, AOS-240, AML-130, ALM-700, and ESC/TGN. After final approval the contractor will deliver two copies to each FAA Regional Headquarters and one copy to each site. No restriction will be placed on the reproduction or use of the operator's manual or associated materials. [ETVS Statement of Work, 8/9/94, 3.6.5.3; ETVS CDRL F13, 4/1/94]

10.5-10.19 Reserved

10.20 Status Assessment

Additional or special system support facility requirements, beyond those normally provided at the FAA Logistics Center, are not anticipated. No system support issues/risks have been identified to date.

11.0 PROGRAM SCHEDULE INFORMATION

11.1 NAS Implementation Schedule

Please refer to figure 11-1 for the ETVS NAS Implementation schedule. All "T±" dates are given in months.

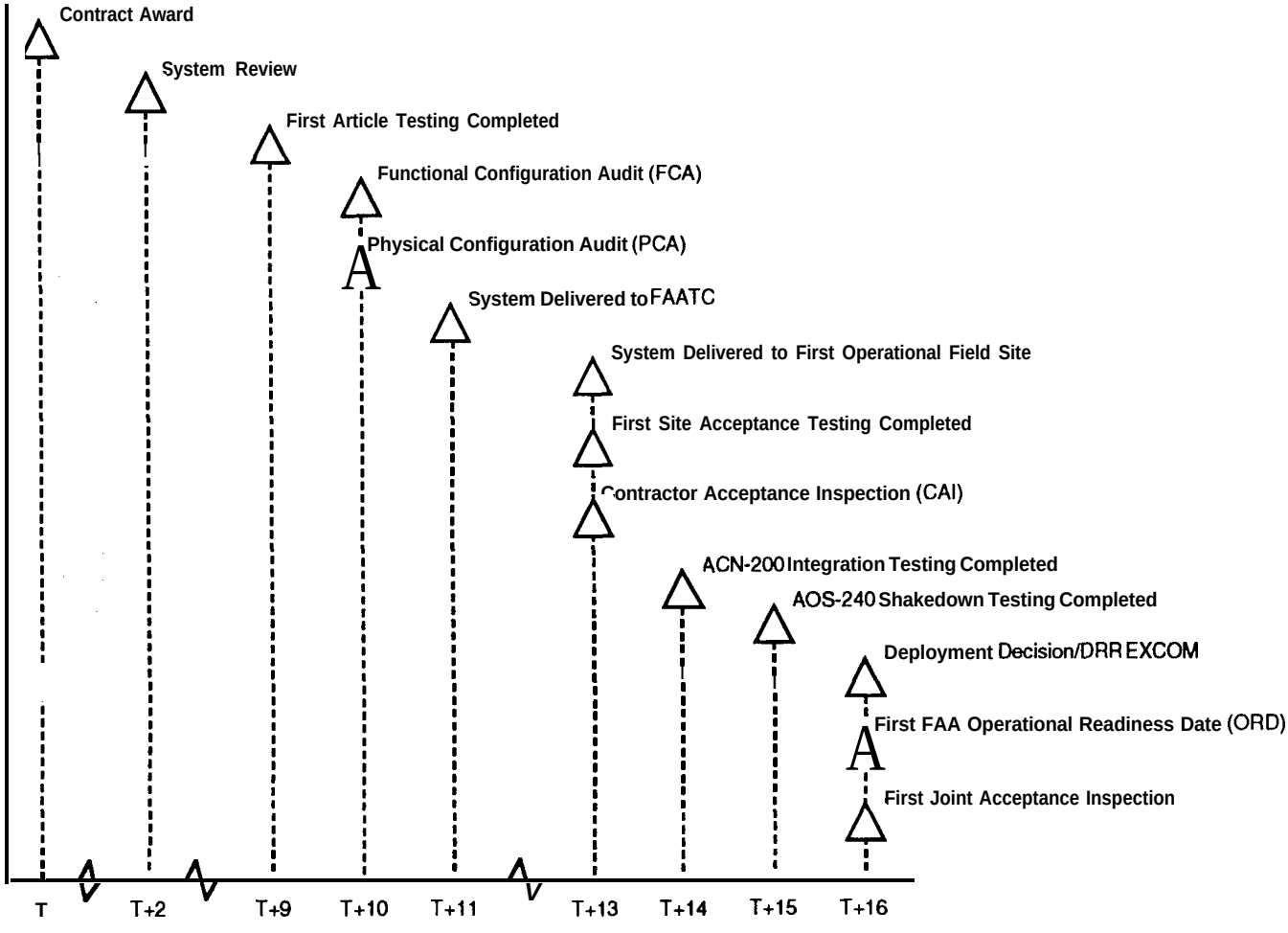

Figure 11-1 ETVS NAS Implementation Schedule

11.2 Deployment Schedule

All sites designated to receive an ETVS have not been identified. A finalized schedule will be developed by ATR-120, Air Traffic Plans and Requirements, Terminal Branch, prior to contract award. An interim site list, included in the draft RFP package is included in Appendix D, Site Deployment Schedule. Department of Defense sites are listed in Appendix D.

11.3 Site Implementation Schedule

Activities to support ETVS site implementation will begin about twelve months prior to equipment delivery. Site implementation activities will continue until Joint Acceptance Inspection (JAI) and the old equipment has been removed. The milestones shown in figure 1 1-2, Site Implementation Milestone Schedule, are typical of ETVS site implementations beginning with delivery to the second site. Considerable variances

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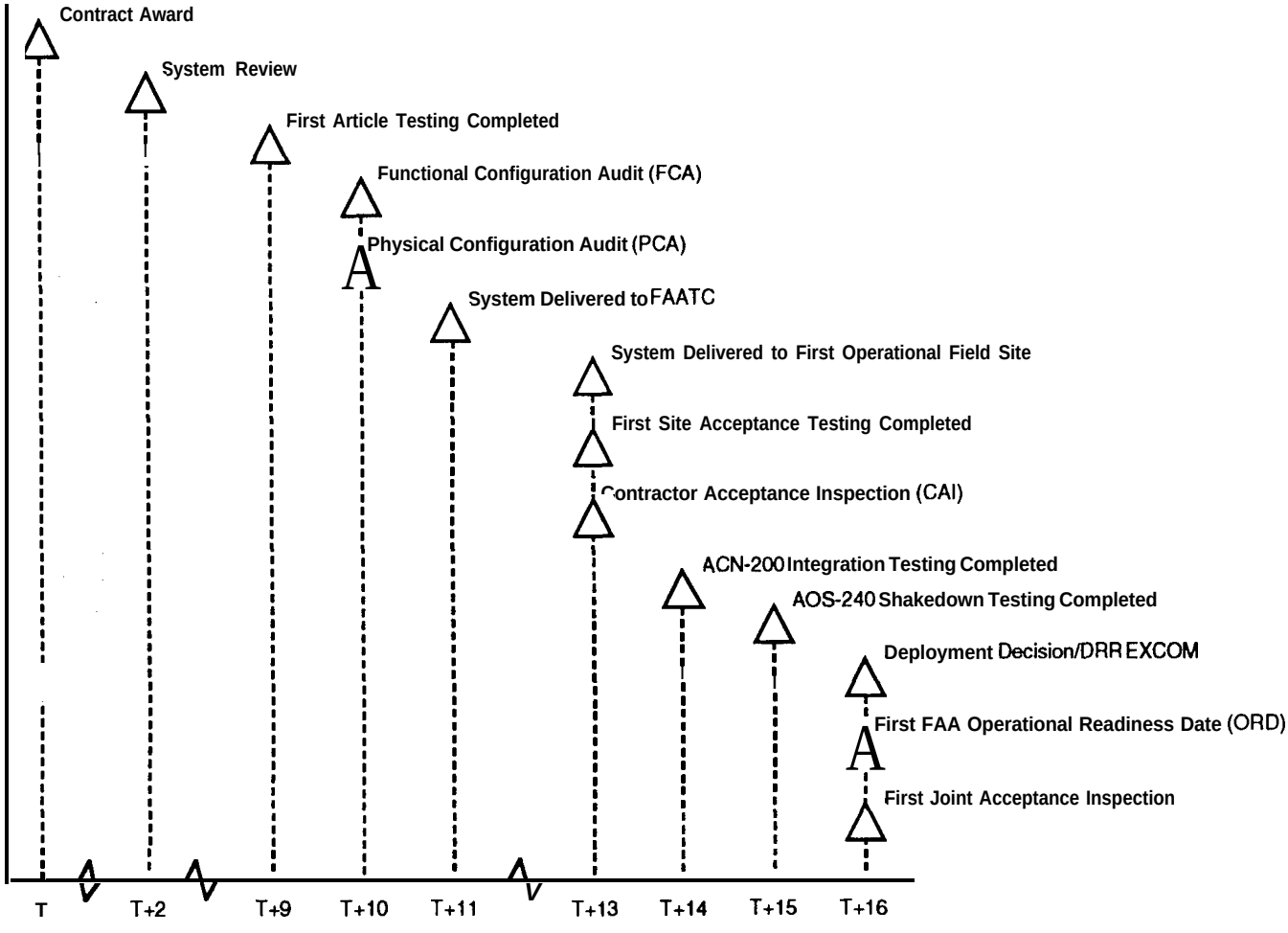

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A schedule network's critical path is defined as the sequence of events or nodes that determine the minimum time in which the schedule can be fulfilled. In figure 1 1-3, the critical path is shown by a bold line. A review of the critical path nodes reveals the tasks that must be expedited to avoid delay of implementation.

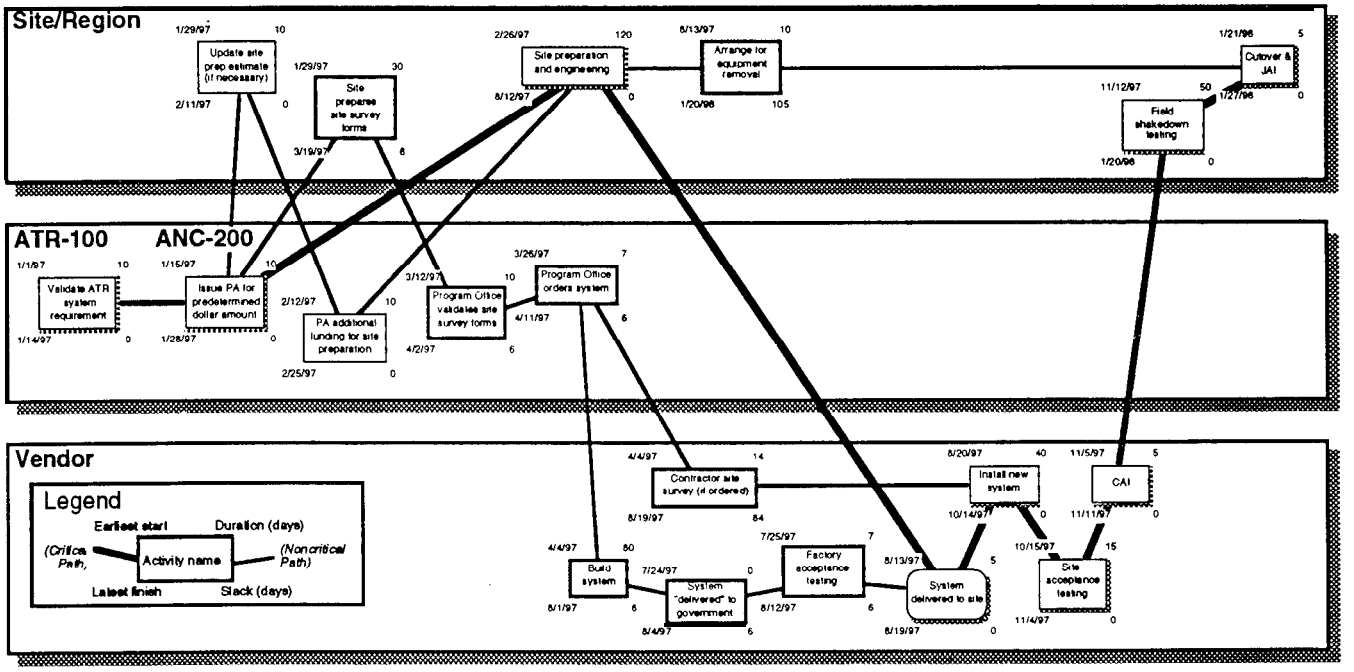

Figure 11-3 Generic ETVS Site Implementation Schedule

11.3.1 Region/Site Critical Path Activities

Figure 11-3 reveals that the most critical activities at the region and site levels are the early identification of new requirements, the update of site preparation estimates, engineering, and site preparation.

11.3.2 Headquarters Critical Path Activities

According to figure 1 1-3, the critical path activities for headquarters are the validation of new requirements, and the issuance and updates of project authorizations (PA) to cover site engineering and preparation.

11.3.3 Vendor Critical Path Activities

Figure 11-3 shows due to time required for site engineering and preparation, most of the vendor's activities (with the exception of delivery, installation, and test) are not on the critical path.

11.4 Schedule Dependencies

ETVS implementation is not dependent on the completion of any other projects.

11.5-11.19 Reserved

11.20 Status Assessment

Final deployment and implementation schedules will be incorporated into the PIP after contract award. No impact on site implementation is anticipated.

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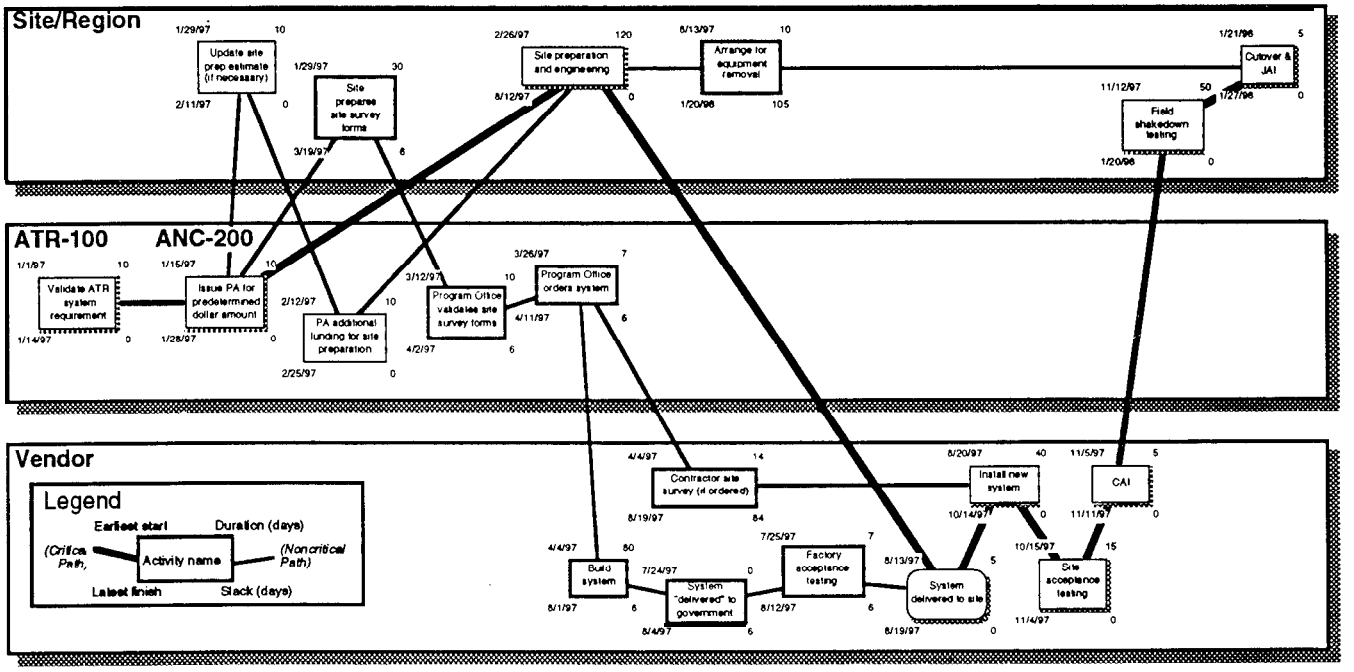

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11.5-11.19 Reserved

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12.0 ADMINISTRATION

12.1 Acquisition Program Summary

In response to a March 1993 request for information, twelve voice switch vendors expressed an interest in participating in a procurement for ETVS equipment. Eight of the vendors provided substantive comments on the ETVS specification. These vendors met with the government to discuss the ETVS spec and brief their products. Several vendors also provided demonstrations of their voice switching equipment. Based on information from these meetings, demonstrations, and comments, the program matrix team concluded that NDI systems are available that satisfy core ENS requirements.

The ETVS acquisition will employ a full and open competition contract. The ETVS RFP identifies basic core requirements to be available at contract award. A subset of items that may not be immediately available will be implemented as Pre-Planned Product Improvements (P^3I). A formal source selection process will be used to evaluate the offerors, including an evaluation of proposals supported by the conduct of an operational performance test and a pre-production capability survey. Selection will be made on the basis of best value offered to the government.

The basic contract will be fixed-price with a time and materials clause to allow for the purchase of engineering services and to allow for adjustments during installation. Installation will also be completed through a time and materials clause. Cost plus fixed fee Contract Line Items (CLINs) will be used to support the modification of equipment to meet P^3I requirements. The contract will include seven option years beyond the initial three year base contract period, and will allow acquisition of systems throughout the duration of the contract. A one year warranty requirement, taking effect with government acceptance of the system, to provide for repair of any failed system components and corrections to software free of charge to the government is included.

Initial funding to cover system acquisition and initial support will be provided from Facilities and Equipment (F&E) funds. Follow-on support will be funded with regional operations appropriations. Initial site maintenance will be accomplished by the contractor. The contract provides for on-site equipment maintenance, technical assistance, depot level repair at a contractor facility, engineering support services, and the procurement of proprietary spare parts, documentation, and training should the government assume full maintenance responsibilities. [ETVS Acquisition Plan, 3/28/94]

12.1.1 Market Survey

The ETVS market survey identified 8-10 firms that could meet core requirements, such as basic G/G and A/G communications plus associated functions and system size (number of positions and interfaces). Several FAA incumbents can currently meet all of the ETVS requirements. None of the contractors surveyed, can meet all of the FAA unique requirements right now. Some development effort will be needed to meet all requirements. [ETVS Market Survey Report, 1 l/l 1/93]

12.1.2 Acquisition Strategy

The ETVS acquisition effort is intended as an NDI procurement with P3I increments to support features not included in NDI switches. New or unique requirements will be segregated into individual packages and development programs will be established in parallel with basic system deployments on a cost-reimbursed basis. These improvement packa gs will be ordered as they are completed for retrofitting at fielded ETVS sites. The best candidates for P^3I packages are an RMMS interface, a management information system, digital interfaces, and provisions for communications traffic data collection. P^3I allows the program office to field new systems early in the procurement while providing more precise control over development and upgrade activities. Individual improvements can be accelerated, changed, or canceled without disrupting the entire program.

Evaluation criteria used for vendor selection will be structured to support a 'best value" procurement. Best value, in the case of the ETVS, means the combination of factors, such as price, technical merit, experience, and supportability, that will provide a quality product at a reasonable price. [ENS Acquisition Plan, 3/28/94]

12.2 ContractingInformation

12.2.1 Prime Contract

Contract award is expected in July 1995. The prime contractor's management and organizational structure, along with that of any major subcontractor or teammate, will be described in the contractor's Project Management Plan and will be summarized in future revisions of the PIP. [ETVS Data Item Description A01, 4/1/94, 3.1]

12.2.2 Service Contracts

No service contracts have been identified at this time.

12.2.3 Program Support Contracts

ARINC Research Corporation is providing technical support to the APME (ANC-600) on the ETVS acquisition effort. The ARINC support staff is located at 1280 Maryland Ave., SW, Suite 580, Washington, DC 20024.

12.2.4 RegionalContracting

The ETVS will be a turnkey installation. Site preparation materials will be funded by the program office, ANC-200. Site preparation labor activities will be funded by the region and performed by regional personnel or support contractors as determined by the region, Schedule and manpower consideration may require utilization of an omnibus support contract for the completion of site preparation activities, such as drilling anchor holes in floors and running communications and power cabling at each site. The use of a support contractors to complete site preparation will be determined on a site by site basis by the region. Funding for support contracts for the completion of site preparation will be funded by the region.

12.2.5 GFP/GFI/GFEObligations

Government Furnished Property (GFP) will not be required for the installation or operation of the ENS. Government Furnished Information (GFI) Site drawings must be made available at the contractor site survey so they can be verified and updated if necessary. Site drawings will be forwarded through the program off ice so as-built drawing packages can be completed. [ETVS Acquisition Plan, 3/28/94]

The only Government Furnished Equipment (GFE) possible for the ETVS are headsets, handsets, and foot switches. The program office is working with the logistics community to define these requirements. The FAA has determined that these items are supportable through the FAA Logistic Center (FAALC). Contract Line Item Numbers (CLINs 0001CD-0001CH) are also an optional means of procurement. These items, whether provided to the site from the FAALC or the contractor, will be available at the site prior to installation.

12.3 Program Management (PM)

12.3.1 PM Charter

The ANC-200 Program Manager (PM) is the FAA executive responsible for the Voice Switching and Recording Program. The PM is responsible for providing direction for the development, budgeting, acquisition, testing, product improvement, and fielding of this program. The PM serves as the spokesperson for this program with international organizations and foreign governments, other Federal departments and agencies, aviation user groups, the general public, and Congress.

12.3.2 Program Management Team (PMT)

See Table 12-1, ETVS/ANC-200 Program Management Team, for the names and telephone numbers of personnel supporting the program manager on the ETVS project.

ETVS/ANC-200 Program Management Team

Name	Routing Symbol	Role	Telephone
Stephen R. Dash	ANC-200 (acting)	Program Manager for Voice and Data Communications	(202) 287-7140
Elaine K. Anthony	ANC-600	APM Engineering	(202) 287-7148
Jim Bunnell, LTjg	DoD JPCO ESC/TG	DoD Program Manager	(202) 646-5687
Ken Law	ANS-200/NISC	APM NAS Implementation	(202) 651-3018
George Clark	ALM-700	APM Logistics	(202) 267-8161
Steve Curran	ACN-200C	APM Test	(609) 485-6779
Alfred Moosakhanian	ASE-200	APM Systems Engineering	(202) 646-2352
TBD	TBD	APM Quality	TBD
Sue Handy	ASU-330	APM Contracts	(202) 267-8828
George P. Kinsey	AGC-510	APM Legal	(202) 267-7564
Leonard Parmley	ATR-120.1	APM Air Traffic Requirements	(202) 267-9183
Bob Stisitis	ARINC Research	Technical Support for ANC-600	(202) 651-3225

7/9/94

Table 12-1 ETVS/ANC-200 Program Management Team

12.3.3 Program Status Reporting

The contractor will inform the ETVS project manager of the state of the ETVS program via **monthly project** status reports (ETVS Data Item Description A02). These reports will provide an assessment of the project's progress, any problems encountered since the last report, and expected events scheduled to occur during the next month. In addition, project management reviews will take place quarterly to review technical, schedule and cost aspects of contract performance, project accomplishments (e.g., milestones met), problems, risks, forecasts and subcontractor activities. The project status reports and program management reviews will help to ensure program progress, identify any problems, and provide a forum for the expedient resolution of any problems. Section 13.2.1.1, Implementation Activities, provides more detailed descriptions of the various meetings, reviews, and audits to be conducted in support of ETVS implementation. [ETVS Statement of Work, 8/9/94, 3.1.2, 3.3.2]

12.3.4 Exception Management

It is the intention of the ETVS project management that there be a free exchange of ideas between the contractor and the government at all technical reviews, audits, and Technical Interchange Meetings (TIMs) in order to establish program progress, identify resolve issues. TIMs may be held at the request of the government or the contractor to discuss in detail any technical or NAILS issues that require resolution or further clarification. [ETVS Statement of Work, 8/9/94, 3.3.5]

Implementation and transition issues will be identified during Transition Information Exchanges (TIEs). The TIE provides an opportunity for review of implementation information and identification and resolution of issues as early in the acquisition cycle as possible. TIEs are conducted by the Program **Manager** (PM) or the Associate Program Manager for NAS Implementation (APMNI) during each phase **of the acquisition** cycle before implementation can proceed to the next acquisition phase. Resolution of implementation issues identified during a TIE are incorporated into the Project Implementation Plan (PIP) issued during the subsequent phase. [Implementation Process Guidelines, 10/93, 2.5]

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7/9/94

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Configuration Management Plan The contractor will develop a single Configuration Management Plan (CMP), Data Item Description B01, addressing both hardware and software in accordance with Appendix A, MIL-STD-973. The plan will describe in detail the CM methodologies for baseline identification and control, status accounting and auditing of software, hardware, firmware, documentation, and support equipment including any automated tools. Procedures specifying the techniques and identifying the steps and forms required to accomplish CM activities will be provided. The CMP will detail the contractor's internal interface responsibilities with program management, systems engineering, Quality Assurance (QA), Test and Evaluation (T&E), logistics, training, and site installation activities. The CMP will address configuration audit planning and procedures. [ETVS Statement of Work, 8/9/94, 3.2]

Configuration Control The contractor will develop and implement detailed procedures by which configuration control is accomplished. The contractor will extend configuration control to cover hardware, software, firmware, and documentation. The contractor will establish a Configuration Control Board (CCB) to support baseline management. The contractor will maintain traceability and currency of the baseline and consistency among all project documentation, hardware, software, firmware, and documentation and their respective versions. The contractor will provide and install any hardware, software, and firmware updates to all previously delivered, undelivered, and future ETVS sites.

Changes to the approved baseline will be submitted to the Contracting Officer in accordance with Appendix D and E, MIL-STD-973, as applicable, relating to Engineering Change Proposals (ECPs) and/or Request for Deviation/Waivers. In addition, the contractor will submit Design Change Notices to implement approved ECPs into provisioning technical documentation. The technical data documentation package will be updated to reflect approved changes. Either the contractor or the government may initiate a change to a proposed or approved baseline. [ETVS Statement of Work, 8/9/94, 3.2.1]

Configuration Status Accounting (CSA) The contractor will generate Configuration Status Accounting Reports (CSAR), Data Item Description B06, to ensure that delivered documentation accurately describes and represents the ETVS hardware and software configurations. The contractor will document the configuration identification and will determine the status of engineering changes, deviations, and waivers with status accounting reports in accordance with Appendix H, I, and J, MIL-STD-973. The reports will include all data to provide traceability of any change for the entire CM life cycle and will be delivered in hard copy. The contractor will describe the tools to be used to accomplish status accounting in the CMP. [ETVS Statement of Work, 8/9/94, 3.2.2]

12.5.2 Configuration Control Boards (CCBs)

The ANC-1 Configuration Control Board (CCB) controls the requirement for changes to project hardware and software baselines during the acquisition phase. After the ETVS system becomes fully operational, configuration management responsibility will transition from ANC-1, Communications and Aircraft Acquisition, to AOS-240, Navaids/Communication Support Engineering. Approval authority for all ETVS modifications will shift from the ANC-1 CCB to the maintenance engineering CCB at the same time. [ETVS Integrated Logistics Support Plan, 2/18/94, 10.4]

12.5.3 CM Milestones

Please refer to figure 12-1 for ETVS configuration management milestones. All "T±" dates are given in months.

12.5.4 Configuration Items

The contractor will select configuration items in accordance with MIL-STD-973. The contractor will implement and maintain a system to identify, label, serialize, and mark both Hardware Configuration Items (HWCI) and Computer Software Configuration Items (CSCI) such that traceability is maintained between all representations of that item throughout the entire CM life cycle. The configuration identification will be documented in the product baseline. [ETVS Statement of Work, 8/9/94, 3.2.2, 3.3.1.1]

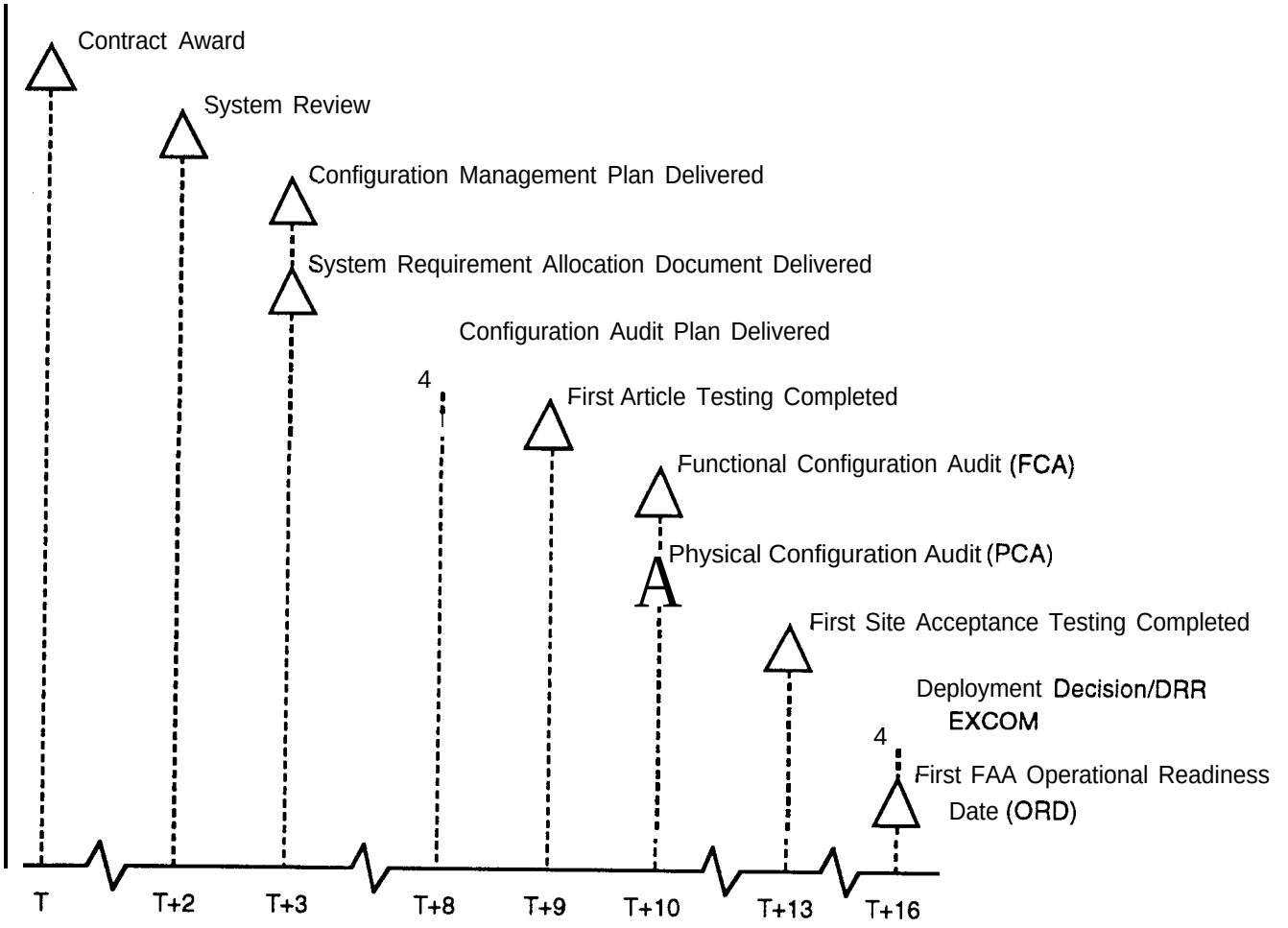

Figure 12-1 Configuration Management Milestones

12.6-12.19 Reserved

12.20 Status Assessment

The ETVS program is similar to other replacement or upgrade projects and, therefore, does not place any additional or unusual administrative or program management requirements on the FAA. No program management risks have been identified to date.

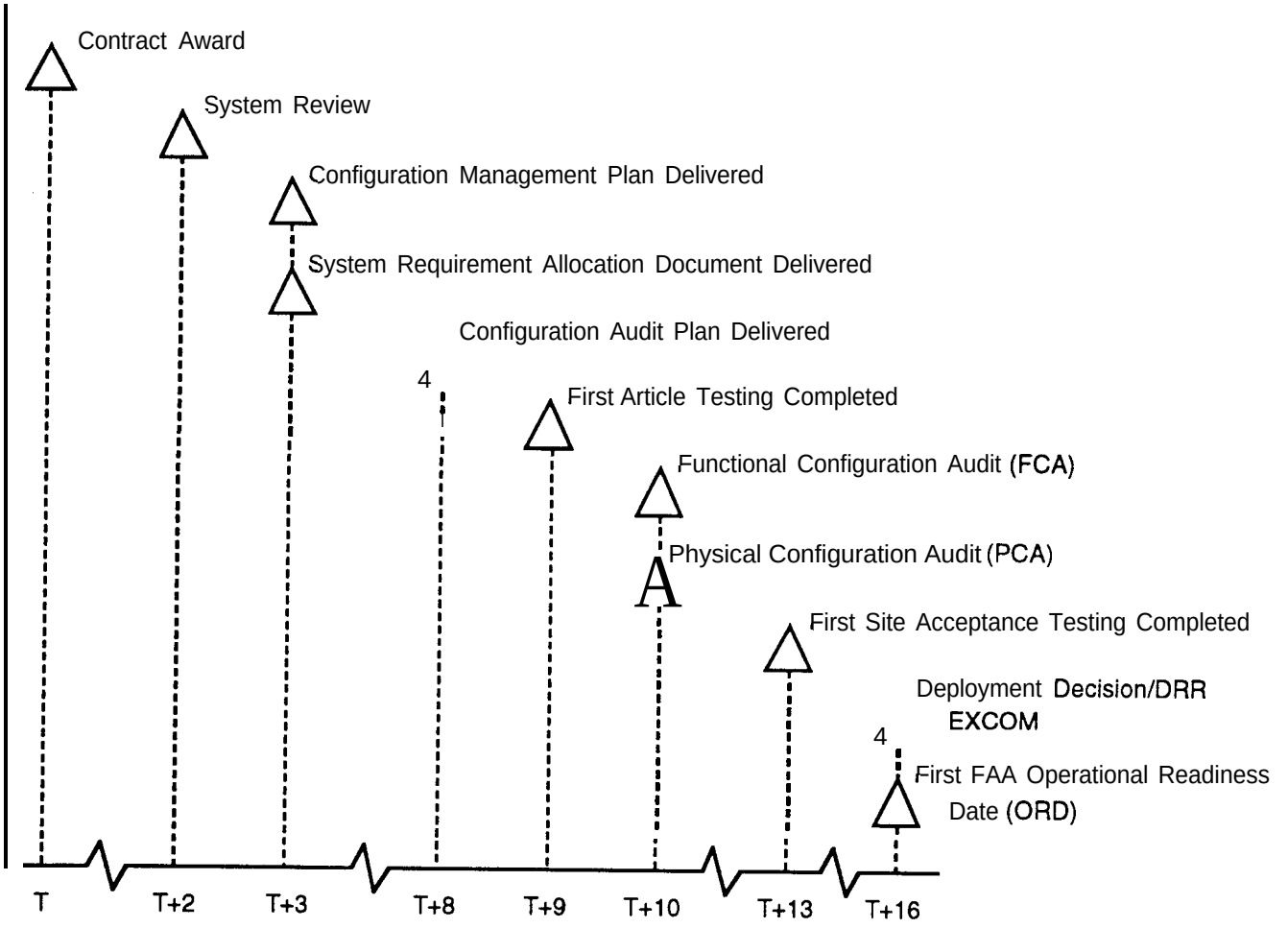

Figure 12-1 Configuration Management Milestones

12.6-1 2.19 Reserved

12.20 Status Assessment

The ETVS program is similar to other replacement or upgrade projects and, therefore, does not place any additional or unusual administrative or program management requirements on the FAA. No program management risks have been identified to date.

13.1.4 Technical Onsite Representatives (TOR)

A TOR will be appointed to witness and participate in the installation, integration, and verification activities at each ETVS site. The TOR will:

- Serve as the focal point for all matters pertaining to site installation activities;
- Identify and coordinate with personnel participating in site preparation and installation;
- Provide installation personnel with access to the site;
- Ensure that contractor installation procedures meet FAA standards;
- Inform the region whenever technical and contractual issues are identified;
- Inform the region on the status of site preparation, equipment deliveries, and installation progress;
- Identify power and grounding connection points, internal facility cable raceways, and buried or hidden utility conduits that would affect the installation effort; and,
- Assist in verification of proper performance of the ETVS during site testing. [STVS Project Implementation Plan, 6/26/92, 55.d]

ETVS TORs will be assigned by the region after the list of sites receiving ETVS systems has been finalized by ATR-120, Air Traffic Plans and Requirements, Terminal Branch.

ETVS Regional Associate Program Managers (RAPM)

Name	Routing Symbol	Region	Telephone
Doug Edwards	ACE-424E	Central Region	(816) 426-2242
Andy Stasiuk	AGL-421.10	Great Lakes Region	(708) 294-7587
Larry Towles	AWP-422	Western Pacific Region	(310) 297-1425
Jim Cammert	ANM-422.T1	Northwest Mountain Region	(206) 227-2426
Ed Davis	ANE-422	New England Region	(617) 238-7435
Ana Gonzalez	ASW-421.3	Southwest Region	(817) 222-4213
Steven LoVerde	AEA-421.3	Eastern Region	(718) 553-1176
Terry Simpson	ASO-420A	Southern Region	(404) 305-6287
Jerry Jensen	AAL-421A	Alaskan Region	(907) 271-3840

7/12/94

Table 13-1 Regional Associate Program Managers

13.1.5 Contract Support

Contractors supporting site implementation will be determined after contract award. Local and regional contractor support for site preparation will be secured as needed by the regions. Funding for contractor labor during site preparation will be provided by the region.

13.2 Site Implementation Process

13.2.1 Implementation Planning Phase

13.2.1.1 Implementation Activities

The following meetings and conferences are scheduled to facilitate implementation planning and issue resolution for ENS.

13.2.1.1.1 Voice Switching Regional Meetings

ANC-200 sponsors semi-annual voice switching regional meetings in various locations with regional representatives to collect and disseminate information and resolve voice switch implementation issues. These meetings are announced in advance by memorandum.

13.2.1.1.2 Deployment Readiness Review (DRR)

The Deployment Readiness Review (DRR) defines the managerial strategy used by the ETVS Program Manager to ensure the ETVS program is ready for integration into the NAS and the regions are prepared to receive ETVS systems. Order 1800.63, National Airspace System (NAS) Deployment Readiness Review (DRR) Program provides the policy as well as the programmatic aspects of the FAA review to ensure the project is ready to be integrated into the NAS, and that the FAA is **ready to receive,** utilize, **and** provide life-cycle support. The Program Manager for Deployment Readiness Review, ALM-200A, supports the program manager's DRR efforts and assures conformance to and management of the DRR program per Order 1800. 63. The Deployment Readiness Review (DRR) process involves an initial DRR review to identify deployment issues, preparation of a DRR report at the conclusion of operational shakedown testing at the first site, conducting a teleconference with DRR team members to review the DRR report, holding a DRR pre brief with the DRR Executive Committee (EXCOM) chairperson and members, and conducting a DRR EXCOM meeting, during which the deployment decision is made. Table 13-2 lists DRR team membership. [STVS Project Implementation Plan, 6/26/92, 70.b]

ETVS Deployment Readiness Review (DRR) Team Members

Organization	Routing Symbol
Associate Administrator for Airway Facilities (chair)	AAF-1
Associate Administrator for NAS Development	AND-1
Associate Administrator for Air Traffic	AAT-1
Associate Administrator for Human Resource Management	AHR-1
Associate Administrator for System Engineering and Development	ASE-1
Associate Administrator for the Aeronautical Center	AMC-1
Director, Communications and Aircraft Acquisition	ANC-1
Director, Systems Maintenance Service	ASM-1
Director, NAS Transition and Implementation Service	ANS-1
Director, Operational Support Service	AOS-1
Manager, Airway Facilities Division, Eastern Region	AEA-400
Manager, Airway Facilities Division, Southwest Region	ASW-400
Manager, Air Traffic Division, Eastern Region	AEA-500
Manager, Air Traffic Division, Southwest Region	ASW-500

Table 13-2, ETVS DRR Team Members

13.2.1.1.3 National Airspace Integrated Logistics Support (NAILS) Program Planning

NAILS Management Team (NAILSMT) Communications Life-Cycle Division, ALM-700, will schedule NAILSMT meetings on a semiannual basis to discuss and resolve maintenance, training, **and other** logistics issues. The NAILSMT will provide a means for coordinating, monitoring schedules and contract performance, and assessing NAILS program progress. NAILSMT meetings will be held at the vendor's facility or at government facilities as ordered by the government. [ETVS Statement of Work, 8/9/94, 3.6.1.2.2]

Logistics Support Analysis (LSA) Guidance Conference (LGC) The **contractor will participate with** Government in a Logistics Support Analysis (LSA) Guidance Conference (LGC). The LGC will **be held at** the contractor's facility within 60 days after contract award to discuss, in detail, such areas as the

contractor's Integrated Support Plan (ISP), provisioning and provisioning technical documentation, Logistic Support Analysis (LSA), LSA Control Number (LCN) structure, the LSA candidate list, the contractor's organization for accomplishing logistics and training requirements, the site/FAALC sparing concept, the Provisioning Parts List (PPL), Engineering Data for Provisioning (EDFP), logistics schedules, the technical instruction book, and any related logistics areas of interest to the government and contractor. [ETVS Statement of Work, 8/9/94, 3.6.1.2.1]

13.2.1.1.4 System Review

The ETVS is a non- developmental project, for which the various design reviews normally conducted on a developmental project are not required. Instead, the project office will conduct preliminary and final system reviews with the vendor, during which the vendor will present a production system configuration to be approved by the Government. The contractor will evaluate the total system requirements and will provide a summary review of system management and support activities at the system reviews.

Preliminary System Review (PSR) The contractor will conduct a PSR within 30 days following the delivery of the preliminary System Requirements Allocation Document (SRAD). Successful completion of the preliminary system review is required prior to the establishment and approval of the functional baseline. Any changes to this baseline will be subject to Government configuration control and will require Government approval prior to implementation. During the PSR, the contractor will present data allocating the requirements of the ETVS specification to system specific Hardware Configuration Items (HWCI) and Computer Software Configuration Items (CSCI). [ETVS Statement of Work, 8/9/94, 3.3.1.1]

The contractor will present data on the following areas of the system design and support:

- Trade-studies and design studies results;
- Functional flow, requirements allocation, and schematic diagrams;
- Equipment layout drawings, including any proprietary designs, processes and information;
- Environmental Control design aspects;
- Electromagnetic compatibility of system design;
- Power distribution and grounding design aspects;
- Mechanical and packaging design of consoles, racks, printed circuit boards, connectors, etc.;
- Safety engineering considerations;
- Security engineering considerations;
- Lists of materials, parts, and processes;
- System reliability/maintainability/availability;
- System weight;
- interface requirements allocated to configuration items and interface control data derived from requirements:
- Mock-ups, models, breadboards, or other hardware as appropriate to display capability;
- Producibility and manufacturing considerations (e.g., materials, tooling, test equipment, processes, facilities), and identify single, sole, and diminishing source.
- Documentation planned for supporting the contract;
- Firmware to be provided with the system;
- CSCI functional flow;
- CSCI structure (top level structure);
- Computer software development and support facilities;
- Human factors considerations of design; and,
- Test and Evaluation program to reduce risk.

Final System Review (FSR) The contractor will conduct a FSR within 30 days of approval of the System Requirements Allocation Document (SRAD) to review and verify specific system solutions that satisfy ETVS specification requirements prior to start of production. The contractor will be prepared to present data on each of the areas addressed during the PSR, as well as technical and schedule risks associated with each configuration item. [ETVS Statement of Work, 8/9/94, 3.3.1.2]

contractor's Integrated Support Plan (ISP), provisioning and provisioning technical documentation, Logistic Support Analysis (LSA), LSA Control Number (LCN) structure, the LSA candidate list, the contractor's organization for accomplishing logistics and training requirements, the site/FAALC sparing concept, the Provisioning Parts List (PPL), Engineering Data for Provisioning (EDFP), logistics schedules, the technical instruction book, and any related logistics areas of interest to the government and contractor. [ETVS Statement of Work, 8/9/94, 3.6.1.2.1]

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- Mock-ups, models, breadboards, or other hardware as appropriate to display capability;
- Producibility and manufacturing considerations (e.g., materials, tooling, test equipment, processes, facilities), and identify single, sole, and diminishing source.
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- Human factors considerations of design; and,
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13.2.1.2 Requirements

Representatives from the organizations listed in Table 13-2 are invited to participate in the various Deployment Readiness Review (DRR) meetings. Implementation requirements to support other ETVS meetings, reviews, and audits are listed in Table 13-3.

ETVS Personnel Requirements for **Meetings,** Reviews, and **Audits**

Meeting, Review, Audit / Organization	ACN-200	AEA-400/500	AFZ-100	ALM-700	AML-200/400/461/641	AMA-433/551	ANC-200	ANC-600	AOS-240	ASE-32/600	ASU-390	ASW-400/500	ATZ-100	ESC/TGL	ESC/TGN	JPCO
NAIL Management Team (NAILSMT)		X	X	X	X	X		X	X	X	X	X	X	X		
LSA Guidance Conference (LGC)		X	X	X	X	X		X	X	X	X	X	X	X		
Preliminary System Review (PSR)	X	X	X					X	X	X	X	X	X		X	X
Final System Review (FSR)	X	X	X					X	X	X	X	X	X		X	X
Training Guidance Conference (TGC)			X	X	X			X	X		X		X	X		
Provisiong Guidance Conference (PGC)				X		X		X	X		X			X		
Provisioning Conference				X		X		X	X		X			X		
Program Management Reviews	X	X					X	X	X	X	X	X			X	X
Test Readiness Review (TRR)	X							X	X		X				X	X
Technical Interchange Meetings (TIMs)	As Required			As Required			As Required		As Required			As Required			As Required	

Table 13-3 ETVS Personnel Requirements for Meetings, Reviews, and Audits

13.2.2 Pre-Installation and Checkout Phase (Pre-INCO)

13.2.2.1 Implementation Activities

The ETVS site implementation phase includes FAA and contractor site surveys, site preparation activities, and delivery of equipment. The purpose of the FAA site survey for ETVS is to identify the level of site preparation required. Site preparation involves repairs, refurbishments, and other actions to make the site ready to accept the installation of ETVS. The purpose of the contractor site survey for ETVS is to identify the baseline system configuration for the site. This information will be confirmed by the program office, and will be used in constructing and assembling an appropriate system for the site. [STVS Project Implementation Plan, 6/26/92, 71.]

13.2.2.1.1 FAA Site Survey

The FAA site survey will be conducted jointly by the appropriate AXX-400 and AXX-500 branches of the region responsible for the site. The site survey will require the verification of site drawings and the completion of worksheets to be provided by the ETVS vendor as part of the Site Installation Management Plan (SIMP) (CDRL E01). Upon completion of the site survey materials, AXX-400 and AXX-500 will meet with the TOR, local air traffic, and airway facilities personnel to finalize the survey materials. The survey and updated site drawings will then be forwarded to ANC-200 and the region can initiate engineering and site preparation activities. Data to be furnished for the site survey will include:

- Number of single operator and split positions;
- Number and type of each telephone circuit (for G/G communications) to be connected to the ETVS;
- Other G/G circuits to be connected to the ETVS (e.g., direct lines to fire and rescue, door intercom, ATS trunks);
- Number and configuration of A/G frequencies to be connected to the ETVS;
- Assignment of circuits and frequencies to positions;
- Assignment of certain special features (e.g., monitoring) to positions;
- Identification of any reserve power system requirements;

- Number of headsets, handsets, and microphones;
- Facility layout information, including location reserved for ETVS equipment; power, grounding, communications line attachments, and cabling routes; and,
- Name and telephone number of site TOR, if available, or else the name and telephone of a regional representative with whom implementation issues may be coordinated until a TOR is named. [STVS Project Implementation Plan, 6/26/92, 71.c]

13.2.2.1.2 Contractor's Site Survey

As ordered by the government, the contractor will conduct the site survey, under supervision of the appropriate AXX-400 division. The site survey will require the verification of site drawings and the completion of worksheets included as part of the Site Installation Management Plan (SIMP) (CDRL E01). Upon completion of the site survey materials, the contractor will prepare a site survey report (CDRL E03) and will modify and add a site specific appendix to the Site Installation, Integration, and Acceptance Test Document (SIIATD) (CDRL E02a). The survey report and updated SIIATD will be forwarded to the respective region and ANC-200 for approval no later than 30 days after completion of the site survey. Upon receiving the deliverables, ANC-200 will initiate the order for the necessary equipment. The site survey report will include the following:

- Floor space and floor loading to accommodate the equipment;
- Heating, air conditioning, humidity, and environmental requirements;
- Electrical power, outlets, and lighting requirements;
- Line circuits and interface requirements;
- Storage, work area, and telephone requirements;
- Location of failure alarms;
- Coordination of site security requirements;
- Identification of special site conditions by the FAA, Telco, OCC, etc.;
- Location and emplacement of demarcs;
- Cabling and runways for power and communications circuits;
- Plant-in-place (emplacement) floor plans or drawings;
- Special cable harnesses required to interconnect equipment;
- Facility modification or construction requirements;
- Work hour restrictions;
- Conflicts with the specification or SOW caused by this site;
- Installation materials list:
- Adequacy of single point grounding;
- Loading zone, dock, and ramp location and ability to accommodate delivery vehicles;
- Requirements for special or heavy duty equipment such as dollies, trolleys, or forklifts; and,
- Corridor, doorway, and equipment room clearances to permit equipment movement through the facility. [ENS Data Item Description E03, 4/1/94, 10.1]

13.2.2.1.3 Site Preparation Tasks

The region is responsible for managing the engineering and accomplishing the site preparation as outlined in the subparagraphs below. The region will be responsible for:

- Determining material shortfalls based on review of ETVS Project Material List (PML) data and generating project status reports. Project specific Project Status Reports (PSR) will be established as required by the regional F&E personnel. In order to establish a material requirements baseline, a PML for the ETVS will be loaded into the FAA Logistics Center resident Project Material Management System (PMMS). Any shortfalls in material needs for regions and individual sites that exist will be determined from PMMS data. Because the ETVS is a turnkey procurement, the PML is expected to consist of the basic equipment only. PSRs will be initiated as required following review of the PML data by regional and site F&E personnel;
- Removing existing equipment;
- Providing necessary floor space for ETVS installation;

- Number of headsets, handsets, and microphones;
- Facility layout information, including location reserved for ETVS equipment; power, grounding, communications line attachments, and cabling routes; and,
- Name and telephone number of site TOR, if available, or else the name and telephone of a regional representative with whom implementation issues may be coordinated until a TOR is named. [STVS Project Implementation Plan, 6/26/92, 71.c]

13.2.2.1.2 Contractor's Site Survey

As ordered by the government, the contractor will conduct the site survey, under supervision of the appropriate AXX-400 division. The site survey will require the verification of site drawings and the completion of worksheets included as part of the Site Installation Management Plan (SIMP) (CDRL E01). Upon completion of the site survey materials, the contractor will prepare a site survey report (CDRL E03) and will modify and add a site specific appendix to the Site Installation, Integration, and Acceptance Test Document (SIIATD) (CDRL E02a). The survey report and updated SIIATD will be forwarded to the respective region and ANC-200 for approval no later than 30 days after completion of the site survey. Upon receiving the deliverables, ANC-200 will initiate the order for the necessary equipment. The site survey report will include the following:

- Floor space and floor loading to accommodate the equipment;
- Heating, air conditioning, humidity, and environmental requirements;
- Electrical power, outlets, and lighting requirements;
- Line circuits and interface requirements;
- Storage, work area, and telephone requirements;
- Location of failure alarms;
- Coordination of site security requirements;
- Identification of special site conditions by the FAA, Telco, OCC, etc.;
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- Cabling and runways for power and communications circuits;
- Plant-in-place (emplacement) floor plans or drawings;
- Special cable harnesses required to interconnect equipment;
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- Removing existing equipment;
- Providing necessary floor space for ETVS installation;

13.2.2.2.3 Physical Facility and Equipment Attributes

The amount of site preparation work required will depend on the difference between the required physical site condition and actual physical site condition. Facilities that meet current FAA standards will require less modification. All facilities will need to add, as a minimum, an individual AC power distribution panel solely for the ETVS equipment (where possible), a separate breaker(s) for ETVS main power (critical power), a signal ground plate and a chassis ground plate for the ETVS equipment, and standard (non-critical) 110 V, 60 Hz power for backroom convenience outlets. More specific site preparation and installation requirements will be identified after completion of site survey worksheets.

13.2.3 Installation and Checkout Phase (INCO)

13.2.3.1 Implementation Activities

The installation and checkout phase for the ETVS includes equipment delivery to the site, installation, integration, checkout, and site acceptance testing. The ETVS vendor will conduct site verification at each site, including site acceptance testing, to ensure that equipment is correctly installed and configured, fully operational, and ready for transfer to the government. Site verification will be conducted according to test procedures published in the Contractor's Master Test Plan (CMTP) and the Site Installation, Integration, and Acceptance Test Document (SIIATD) in the presence of the TOR and other government representatives as designated. The Installation and Checkout Phase will end with completion of the Contract Acceptance Inspection (CAI), which is the formal acceptance by the FAA of the ETVS system from the contractor.

13.2.3.1.1 ETVS Delivery

The subparagraphs below identify the responsibilities of the ETVS vendor and the TOR for system delivery.

ETVS vendor responsibilities The vendor will:

- Contact the TOR or other designated AXX-400 representative by letter to request a suitable date and time for delivery, and to obtain delivery instructions;
- Provide names of installation team members and identify requirements for parking;
- Assemble and pack all ETVS material and equipment in accordance with the contract and ship it from the vendor's facilities to each designated ETVS facility;
- Unload all ETVS material and equipment and place it (if necessary) into temporary storage at the ETVS facility (i.e., at the loading dock);
- Move all ETVS material and equipment to the installation area designated by the TOR;
- Unpack, inspect, inventory, and secure all ETVS material and equipment to make it ready for installation;
- Provide all personnel and equipment (including vehicles, hand trucks, dollies, tools, etc.) needed to carry out the above items; and,
- Dispose of all packing materials and other waste in accordance with the instructions of the TOR. [STVS Project Implementation Plan, 6/26/92, 72.a]

FAA Responsibilities The site TOR or other AXX-400 personnel will:

- Coordinate date and time of delivery with vendor, and provide delivery instructions;
- Ensure that site survey activities are complete in accordance with paragraph 13.2.2.1.1/2;
- Arrange off-loading facilities for ETVS material and equipment deliveries;
- Arrange parking for installation team vehicles;
- Ensure that equipment can be moved directly to installation area, or if not, arrange for temporary storage space;
- Identify delivery routes within the ETVS facility to the installation areas and arrange for necessary facility access for installation team members; and,
- Arrange for disposal of packing materials and other waste. [STVS Project Implementation Plan, 6/26/92, 72.b]

13.2.3.1.2 ETVS Installation

The subparagraphs below identify the responsibilities of the ETVS vendor and the TOR for system installation. Detailed installation procedures will be identified after contract award in the Site Installation, Integration, and Acceptance Test Document (SIIATD), CDRL E02.

ETVS vendor responsibilities The ETVS vendor will:

- Connect equipment to the AC power distribution panel and facility ground as instructed by the TOR;
- Install all system wiring, including intra-building cable runs;
- Connect equipment to facility power supply and grounding network;
- Connect external interfaces (e.g., telephone lines), providing intermediate wiring as stipulated in the contract and the approved site installation plan;
- Affix labels, signs, or other identifiers as required for the use of operators and maintainers.;
- Supply all tools, equipment, and materials needed to accomplish the tasks in subparagraphs above; and,
- Minimize disruption to other facility construction efforts or ongoing government operations. [STVS Project Implementation Plan, 6/26/92, 73.a]

TOR responsibilities The ETVS TOR will:

- Review site installation plan with installation team before start of work;
- Supervise all installation efforts and provide facility escorts as required;
- Arrange access for installation team to install intra-building cable runs (e.g., in cable trays, above ceiling, below floor, etc.): and,
- Coordinate installation team's efforts with other ongoing activities (e.g., other construction efforts or government operations). [STVS Project Implementation Plan, 6/26/92, 73.b]

13.2.3.1.3 ETVS Verification

The subparagraphs below identify the responsibilities of the ETVS vendor and the TOR for system verification (i.e., Site Acceptance Testing). Detailed verification procedures will be identified after contract award in the Site Installation, Integration, and Acceptance Test Document (SIIATD), CDRL E02.

ETVS vendor responsibilities For site verification, the ETVS vendor will:

- Develop test scenarios and procedures and publish them in the Contractor's Master Test Plan (CMTP) for government approval;
- Provide all equipment, software, tools, test equipment, and emulation equipment (i.e., for external interfaces) required for site verification;
- Conduct all site verification activities in the presence of the TOR or other designated government personnel; and,
- Log all test results and produce test reports in accordance with the ETVS contract. [STVS Project Implementation Plan, 6/26/92, 82.a]

TOR responsibilities For site verification, the designated TOR will:

- Review and approve contractor test plans and procedures;
- Ensure that vendor has made sufficient effort to minimize the impact of site verification on ATC facility operations;
- Participate in and observe site verification activities;
- Ensure that test failures are analyzed, that necessary corrections are made, and that re testing is completed: and,
- Record all data necessary for completion of further site verification activities. [STVS Project Implementation Plan, 6/26/92, 82.b]

13.2.3.1.4 Contract Acceptance Inspection (CAI)

The Contract Acceptance Inspection (CAI) is the acceptance by the FAA of the ETVS from the contractor. The CAI will be conducted by the designated Technical Onsite Representative (TOR) after completion of

the Site Acceptance Test. A pre-CAI punch list will be developed by the TOR with the assistance of Sector Maintenance personnel. This punch list will identify corrective actions which should be taken by the contractor before the ETVS is accepted by the FAA and will help prevent exceptions on the Joint Acceptance Inspection (JAI). The regional AF Establishment Engineering Branch, AXX-45X, will have all discrepancies identified corrected prior to the JAI. [FAA Order 6030.45A, 11/24/93, 403]

13.2.3.1.5 Facility Reference Data File (FRDF)

The Facility Reference Data File (FRDF) is a file of technical reference data on the characteristics and performance of all FAA maintained or FAA owned facilities. The FRDF serves as an historical record of facility and equipment performance and is used to facilitate day-to-day, periodic, and corrective maintenance activities, technical inspections, management evaluations, and aircraft accident/incident investigations. The regional AF sectors are responsible for updating the FRDF to accurately reflect changes in equipment configuration at a facility, such as after the addition of new equipment. An FRDF section must be established for the ETVS and contain, as a minimum, copies of the CAI and JAI reports, any NAS Change Proposals (NCPs) and Configuration Control Decisions (CCDs) necessitated by ETVS implementation, a list of available equipment drawings, a list of ETVS technical instruction books, and a list of applicable test data documents provided by the ETVS contractor. Equipment drawings, technical instruction books, and test data documents should be readily accessible, but need not be physically included in the FRDF. The FRDF should be updated throughout the installation and testing of the ETVS to ensure that the commissioning requirement for an accurate FRDF is met. [FAA Order 6030.45A, 11/24/93,200]

13.2.3.2 Requirements

13.2.3.2.1 Financial Resources

Funding to support ACN-200 and ANC-200 installation and checkout activities (i.e., site acceptance testing oversight) will be provided by the program office. Regional Facilities and Equipment (F&E) and Sector Maintenance (SM) personnel participation will be funded by the region.

13.2.3.2.2 Human Resources

For the first ETVS installation only, a representative of ACN-200, FAA Technical Center, Automation Division, will serve as TOR and will perform the duties listed above in subparagraph 13.2.3.1.2, ETVS Installation. At subsequent sites, two representatives from ACN-200 will be present during installation and site acceptance testing. The program office, ANC-200, will provide technical support to the regions for site verification, including training and orientation, and provision of technical data. ANC-200 representatives will attend site acceptance testing to expedite successful test completion and acceptance. Two regional F&E representatives and one SM representative will support installation and checkout activities at each site.

13.2.3.2.3 Physical Facility and Equipment Attributes

All site preparation work should be completed prior to equipment delivery to the site. The only required facility modifications by the installation and checkout phase will be emplacement of system wiring, including intra-building cable runs. These modifications will allow connection of ETVS equipment to facility power supply, grounding network, and external interfaces (e.g., telephone lines).

13.2.4 Integration Phase

13.2.4.1 Implementation Activities

After successful completion of site acceptance testing and the system has been formally accepted from the contractor by the FAA (Contract Acceptance Inspection, CAI), ACN-200, Voice Switching Automation Division, will perform NAS Operational Test and Evaluation (OT&E)/Integration and OT&E/Operational testing. The System Integration Phase of site implementation will end with FAA Sector Maintenance declaration of the Initial Operating Capability (IOC).

the Site Acceptance Test. A pre-CAI punch list will be developed by the TOR with the assistance of Sector Maintenance personnel. This punch list will identify corrective actions which should be taken by the contractor before the ETVS is accepted by the FAA and will help prevent exceptions on the Joint Acceptance Inspection (JAI). The regional AF Establishment Engineering Branch, AXX-45X, will have all discrepancies identified corrected prior to the JAI. [FAA Order 6030.45A, 11/24/93, 403]

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Funding to support ACN-200 and ANC-200 installation and checkout activities (i.e., site acceptance testing oversight) will be provided by the program office. Regional Facilities and Equipment (F&E) and Sector Maintenance (SM) personnel participation will be funded by the region.

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For the first ETVS installation only, a representative of ACN-200, FAA Technical Center, Automation Division, will serve as TOR and will perform the duties listed above in subparagraph 13.2.3.1.2, ETVS Installation. At subsequent sites, two representatives from ACN-200 will be present during installation and site acceptance testing. The program office, ANC-200, will provide technical support to the regions for site verification, including training and orientation, and provision of technicat data. ANC-200 representatives will attend site acceptance testing to expedite successful test completion and acceptance. Two regional F&E representatives and one SM representative will support installation and checkout activities at each site.

13.2.3.2.3 Physical Facility and Equipment Attributes

All site preparation work should be completed prior to equipment delivery to the site. The only required facility modifications by the installation and checkout phase will be emplacement of system wiring, including intra-building cable runs. These modifications will allow connection of ETVS equipment to facility power supply, grounding network, and external interfaces (e.g., telephone lines).

13.2.4 Integration Phase

13.2.4.1 Implementation Activities

After successful completion of site acceptance testing and the system has been formally accepted from the contractor by the FAA (Contract Acceptance Inspection, CAI), ACN-200, Voice Switching Automation Division, will perform NAS Operational Test and Evaluation (OT&E)/Integration and CT&E/Operational testing. The System Integration Phase of site implementation will end with FAA Sector Maintenance declaration of the Initial Operating Capability (IOC).

13.2.4.2.3 Physical Facility and Equipment Attributes

All site preparation and equipment installation work should be completed prior to the beginning of system integration testing. No facility modifications should be required by the system integration phase of ETVS implementation.

13.2.5 Field Shakedown Phase

13.2.5.1 Implementation Activities

The Field Shakedown Phase starts after the Initial Operation Capability (IOC) decision that determines that the ETVS installation and testing have been completed and meet defined requirements. The Field Shakedown Phase will end upon successful completion of the final Joint Acceptance Inspection (JAI) by the appropriate Airway Facilities and Air Traffic personnel.

13.2.5.1.1 OT&E/Shakedown Testing

For the first ETVS field site (not the FAA Technical Center), or other designated key site, AOS-200, National Airway System Engineering Division, will perform NAS Operational Test and Evaluation (OT&E)/Shakedown testing on an ENS that has successfully passed site verification (please refer to section 9.1.1, Government Test Program, for a more detailed description of OT&E/Shakedown testing). OT&E/Shakedown testing is similar to OT&E/Operational testing, but is performed at the site where the ETVS equipment will actually be used. Shakedown testing will ensure that the ETVS performs reliably, meets operational requirements, and can be maintained under actual ATC facility working conditions. The ETVS vendor generally will not be involved in shakedown testing, although there are provisions in the ETVS contract for limited engineering support as may be required. Field shakedown testing, similar to the OT&E/Shakedown testing conducted at the first ETVS field site, will be performed at all subsequent sites.

For shakedown testing, AOS-200 will:

- Ensure that all necessary equipment and tools are available;
- Ensure that the impact of testing on ATC facility operations is minimized;
- Develop an OT&E/Shakedown Test Plan. This test plan will contain the approach to testing, requirements to be tested, management of the test, scheduling information, and resources required for the test. The shakedown test plan is expected approximately six months prior to the start of OT&E/Shakedown testing at the first field site: [ETVS TEMP, 4/26/94, 3.3.1.3]
- Ensure adequacy of shakedown prerequisites such as operator and maintenance training, availability of spares, special tools, and test equipment, etc.;
- Conduct tests, assisted by other government personnel as required;
- Ensure that test failures are analyzed, that necessary corrections are made, and that retests are successfully completed: and,
- Report shakedown test results (in particular, to the Deployment Readiness Review Executive Committee, DRR EXCOM). [STVS Project Implementation Plan, 6/26/92, 84.]

13.2.5.1.2 Joint Acceptance Inspection (JAI)

The Joint Acceptance Inspection (JAI) is an activity intended to gain consensus of all involved groups that installation and testing of the ETVS have been completed in accordance with national criteria and that the ETVS is capable of performing its required functions. The Contract Acceptance Inspection (CAI) is the acceptance of the ETVS from the contractor by the FAA. The JAI is the acceptance of the ETVS for maintenance and operation by the using organizations (i.e., Air Traffic, Airway Facility, and Sector Maintenance). The JAI is normally the time at which the custody and maintenance responsibilities of equipment is transferred from the contractor to the responsible FAA maintenance organization. As an integral part of the overall JAI, an Operational Readiness Demonstration (ORD) will be conducted. [FAA Order 6030.45A, 1 1/24/93, 403, FAA Order 6020.2A, 3/28/74, 5.b]

Joint Acceptance Board (JAB) A Joint Acceptance Board (JAB) will be convened to inspect and evaluate the installation to determine that the ETVS has been installed and tested in accordance with engineering plans, standard drawings, the ETVS specification, FAA installation standards and criteria, and

all applicable safety codes. The JAB will determine whether the ETVS adequately provides for maintenance needs (i.e., tools, test equipment, documentation, updated property records, facility supply inventory of ETVS spares) and that the ETVS is capable of performing its advertised functions on a commissioned basis. The Airway Facilities Sector representative will act as chairperson of the JAB. The JAB will include, as a minimum, representatives from the following organizations:

- Regional Airway Facilities Division Establishment Engineering Branch, AXX-45X;
- Regional Airway Facilities Sector, AXX-46X;
- Regional Air Traffic, AXX-4XX;
- Regional Flight Standards, AXX-2XX; and,
- Regional Logistics, AXX-5XX. [FAA Order 6020.2A, 3/28/74, 8.b]

Joint Acceptance Report The Joint Acceptance Report will provide a documented basis for acceptance and commissioning of the ETVS. The Airway Facilities Sector representative of the JAB will be responsible for the preparation and distribution of the report. One copy of the report will be provided to each member of the JAB and to off ices responsible for the resolution of exceptions. The report will contain the following items:

- Location name and facility type:
- Names of all personnel participating in the inspection;
- Date of the inspection;
- A statement concerning adjustment and performance of the ETVS and whether its operation is compatible with operation of other facility equipment;
- A statement concerning the availability of instruction materials, as built drawings, test and operating equipment, and initial spares;
- A statement of whether the installation and Site Acceptance Test were completed in a neat and workpersonlike manner:
- A statement of exceptions with a recommendation relative to the action required and office responsible for correcting exceptions;
- A statement indicating acceptance or non acceptance of the ETVS; and,
- A statement of compliance with FAA security requirements. [FAA Order 6020.2A, 3/28/74, 9.c]

13.2.5.1.3 Operational Readiness Demonstration (ORD)

The Operational Readiness Demonstration, a part of the Joint Acceptance Inspection described above, is a formal demonstration that the ETVS is ready to support real-time air traffic control communications tasks. The ORD demonstrates the readiness of personnel, procedures, hardware, software, and support services. The ORD will examine the following operational, maintenance, and engineering areas:

- Final refinement of operating procedures, methods, adaptation, and parameters;
- Demonstration of all aspects that involve actual control of air traffic prior to commissioning;
- Verification that ENS equipment documentation accurately describes the system installed at the facility at the time it becomes operational;
- Verification that sufficient staffing exists and that personnel are sufficiently trained and familiar with ENS functions and equipment; and,
- Verification that required ETVS logistics support capability has been established and that technical logistics data and support material needed for operational use of the ETVS have been furnished. [FAA Order 6020.2A, 3/28/74, 5.b]

13.2.5.2 Requirements

13.2.5.2.1 Financial Resources

Funds provided to AOS-200, National Airway Systems Engineering Division, by ANC-200 will be used to cover travel and per diem expenses incurred during OT&E/Shakedown test performance at the first site. ANC-200 will also fund AOS-200 participation in Field Shakedown testing activities at subsequent sites. Regional Associate Program Manager (RAPM), Facilities and Equipment (F&E), Sector Maintenance (SM), and Air Traffic (AT) personnel required to support shakedown testing activities at the first and any follow-on sites will be funded by the regions.

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- Regional Airway Facilities Division Establishment Engineering Branch, AXX-45X;
- Regional Airway Facilities Sector, AXX-46X;
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- Location name and facility type:
- Names of all personnel participating in the inspection;
- Date of the inspection;
- A statement concerning adjustment and performance of the ETVS and whether its operation is compatible with operation of other facility equipment;
- A statement concerning the availability of instruction materials, as built drawings, test and operating equipment, and initial spares;
- A statement of whether the installation and Site Acceptance Test were completed in a neat and workpersonlike manner:
- A statement of exceptions with a recommendation relative to the action required and office responsible for correcting exceptions;
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- Demonstration of all aspects that involve actual control of air traffic prior to commissioning;
- Verification that ENS equipment documentation accurately describes the system installed at the facility at the time it becomes operational;
- Verification that sufficient staffing exists and that personnel are sufficiently trained and familiar with ENS functions and equipment; and,
- Verification that required ETVS logistics support capability has been established and that technical logistics data and support material needed for operational use of the ETVS have been furnished. [FAA Order 6020.2A, 3/28/74, 5.b]

13.2.5.2 Requirements

13.2.5.2.1 Financial Resources

Funds provided to AOS-200, National Airway Systems Engineering Division, by ANC-200 will be used to cover travel and per diem expenses incurred during OT&E/Shakedown test performance at the first site. ANC-200 will also fund AOS-200 participation in Field Shakedown testing activities at subsequent sites. Regional Associate Program Manager (RAPM), Facilities and Equipment (F&E), Sector Maintenance (SM), and Air Traffic (AT) personnel required to support shakedown testing activities at the first and any follow-on sites will be funded by the regions.

13.2.7.1.2 Disposal

The regional Property Disposal Officer (PDO), under the direction of ALM-300, Material Management Division (acting as the FAA Property Management Officer), will dispose of equipment removed to make way for ETVS in accordance with Order 4800.2B, Utilization and Disposal of Excess and Surplus Property. [STVS Implementation Plan, 7/15/93, 8.2.1]

13.2.7.2 Requirements

13.2.7.2.1 Financial Resources

Regions will be responsible for the funding of removal and disposal of replaced voice switching equipment.

13.2.7.2.2 Human Resources

Equipment removal procedures will be developed by regional AF Facilities and Equipment personnel and approved by AF Sector Maintenance.

Property Disposal Officers (PDOs) in the region are responsible for coordinating the disposal of excess and surplus FAA property with the property manager at the site. [FAA Order 4800.2B, 10/11/91, 22.b]

13.2.7.2.3 Physical Facility and Equipment Attributes

Replaced voice switching equipment, if leased, will be disposed of after submission of a Telecommunications Service Request (TSR) to ASU-330. Replaced voice switching that is owned by the government will disposed of in accordance with FAA Order 4800.2B.

13.3-13.19 Reserved

13.20 Status Assessment

No implementation issues/risks have been identified to date. Delivery and installation schedules will be established prior to contract award. Multiple systems per region will be staggered so as not to impact regional AF or AT personnel resources. Site preparation funding requirements will be established at contract award.

APPENDIX A GENERIC SITE IMPLEMENTATION PLAN (GSIP)

The Generic Site Implementation Plan (GSIP) has been developed as a tool to assist regional and site personnel with development of site specific implementation plans. Regional and site personnel can tailor this activity list to fit their own needs and avoid developing each Site Implementation Plan (SIP) from scratch. The GSIP contains a broad list of anticipated activities necessary for the installation and testing of an ETVS system at a site. The information is organized by the seven phases of the site implementation process discussed in chapter 13 of the Project Implementation Plan (PIP).

The list is a starting point for identifying those activities required to successfully complete implementation at a specific site. Facilities differ depending on environment (i.e., control tower or TRACON), size, location, age, facility configuration, and operational requirements. Some activities listed in the GSIP, therefore, may not apply and can be removed from the list. Other activities may be added to the list as needed in order to complete the site installation plan. Once tailored for a particular site, the GSIP normally becomes the SIP at that particular site. A suggested outline for a SIP is given below. The SIP outline is organized by the same eleven essential elements found in the PIP and allows for cross referencing of information in the PIP down to the site specific details found in the SIP. Background and related program information already found in the PIP need not be duplicated in the SIP. Following site implementation, information contained in the SIP should be placed in the respective Facility Reference Data File (FRDF).

ETVS Site Implementation Plan (SIP) Outline

Section	Topic
Section 1	General
Section 2	Overview
Section 3	AF Operations
Section 4	AT Operations
Section 5	Systems Configuration and Engineering
Section 6	Physical Facilities
Section 7	Financial Resources
Section 8	Human Resources
Section 9	Test and Evaluation
Section 10	System Support
Section 11	Schedule
Section 12	Administration
Section 13	Implementation

A DOS or Macintosh compatible soft copy of the GSIP can be provided to run on either PC or Macintosh hardware using Microsoft Excel. The list can easily be customized using Excel and information can be sorted by attribute and task lists can be generated by responsible individual, responsible organization, or essential element. Requests for formats other than Excel will be addressed by the Associate Program Manager for NAS Implementation (APMNI), Ken Law, at (202) 651-3018.

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APPENDIX C ACRONYMS

The following acronyms appear in the ETVS PIP:

A/G	Air-to-ground
AAS	Advanced Automation System
AC	Alternating Current
AF	Airway Facilities
AFSS	Automated Flight Service Station
APME	Associate Program Manager Engineering
APMNI	Associate Program Manager NAS Implementation
APMQ	Associate Program Manager Quality
APMR	Associate Program Manager Requirements
APMSE	Associate Program Manager Systems Engineering
APMT	Associate Program Manager Test
ARC	Acquisition Review Committee
ARTCC	Air Route Traffic Control Center
AT	Air Traffic
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
ATIS	Automated Terminal Information Service
ATS	Administrative Telephone System
BS	Basic System
C	Centigrade
CAI	Contract Acceptance Inspection
CCB	Configuration Control Board
CCD	Configuration Control Decision
CFR	Code of Federal Regulations
CHI	Computer-Human Interface
CIC	Coordinator Instrument Console
CLIN	Contract Line Item Number
CM	Configuration Management
CMP	Configuration Management Plan
CMTP	Contractor's Master Test Plan
COTS	Commercial Off-the-Shelf
CSA	Configuration Status Accounting
CSAR	Configuration Status Accounting Report
CSCI	Computer Software Configuration Item
CTD	Communications Traffic Data
DoD	Department of Defense
DRR	Deployment Readiness Review
DRR/EXCOM	DRR Executive Committee
DT&E	Developmental Test and Evaluation
DVRS	Digital Voice Recorder System
E&R	Exchange and Repair
ECP	Engineering Change Proposal
EDFP	Engineering Data For Provisioning
ESC/TG	Electronic Systems Center Communications and Airspace Management Systems Directorate
ETVS	Enhanced Terminal Voice Switch
F&E	Facilities and Equipment
FAA	Federal Aviation Administration
FAALC	FAA Logistics Center
FAATC	FAA Technical Center
FAT	First Article Test
FCA	Functional Configuration Audit
FDC	Flight Data Console
FDCS	Flight Data Console Shelf
FRDF	Facility Reference Data File
FSR	Final System Review
FSS	Flight Service Station
FTS	Federal Telecommunications System
G/G	Ground-to-Ground
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFP	Government Furnished Properly
HAZMAT	Hazardous Material
HCVR	High Capacity Voice Recorder
HVAC	Heating, Ventilation, and Air Conditioning
HWCI	Hardware Configuration Item
Hz	Hertz

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A/G	Air-to-ground
AAS	Advanced Automation System
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AF	Airway Facilities
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APME	Associate Program Manager Engineering
APMNI	Associate Program Manager NAS Implementation
APMQ	Associate Program Manager Quality
APMR	Associate Program Manager Requirements
APMSE	Associate Program Manager Systems Engineering
APMT	Associate Program Manager Test
ARC	Acquisition Review Committee
ARTCC	Air Route Traffic Control Center
AT	Air Traffic
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
ATIS	Automated Terminal Information Service
ATS	Administrative Telephone System
BS	Basic System
C	Centigrade
CAI	Contract Acceptance Inspection
CCB	Configuration Control Board
CCD	Configuration Control Decision
CFR	Code of Federal Regulations
CHI	Computer-Human Interface
CIC	Coordinator Instrument Console
CLIN	Contract Line Item Number
CM	Configuration Management
CMP	Configuration Management Plan
CMTP	Contractor's Master Test Plan
COTS	Commercial Off-the-Shelf
CSA	Configuration Status Accounting
CSAR	Configuration Status Accounting Report
CSCI	Computer Software Configuration Item
CTD	Communications Traffic Data
DoD	Department of Defense
DRR	Deployment Readiness Review
DRR/EXCOM	DRR Executive Committee
DT&E	Developmental Test and Evaluation
DVRS	Digital Voice Recorder System
E&R	Exchange and Repair
ECP	Engineering Change Proposal
EDFP	Engineering Data For Provisioning
ESC/TG	Electronic Systems Center Communications and Airspace Management Systems Directorate
ETVS	Enhanced Terminal Voice Switch
F&E	Facilities and Equipment
FAA	Federal Aviation Administration
FAALC	FAA Logistics Center
FAATC	FAA Technical Center
FAT	First Article Test
FCA	Functional Configuration Audit
FDC	Flight Data Console
FDCS	Flight Data Console Shelf
FRDF	Facility Reference Data File
FSR	Final System Review
FSS	Flight Service Station
FTS	Federal Telecommunications System
G/G	Ground-to-Ground
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFP	Government Furnished Properly
HAZMAT	Hazardous Material
HCVR	High Capacity Voice Recorder
HVAC	Heating, Ventilation, and Air Conditioning
HWCI	Hardware Configuration Item
Hz	Hertz

STVS	Small Tower Voice Switch
TCS	Tower Control System
TELCON	Telephone Conference
TEMP	Test and Evaluation Master Plan
TGC	Training Guidance Conference
TIE	Transition Information Exchange
TIM	Technical Interchange Meeting
TM&O	Telecommunications Management and Operations
TOR	Technical Onsite Representative
TPRC	Test Policy Review Committee
TRACON	Terminal RADAR Approach Control
TRR	Test Readiness Review
TSR	Telecommunications Service Request
TVSR	Terminal Voice Switch Replacement
USAF	United States Air Force
VA	Volt-Amperes
VFR	Visual Flight Rule
VHF	Very High Frequency

STVS	Small Tower Voice Switch
TCS	Tower Control System
TELCON	Telephone Conference
TEMP	Test and Evaluation Master Plan
TGC	Training Guidance Conference
TIE	Transition Information Exchange
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TRR	Test Readiness Review
TSR	Telecommunications Service Request
TVSR	Terminal Voice Switch Replacement
USAF	United States Air Force
VA	Volt-Amperes
VFR	Visual Flight Rule
VHF	Very High Frequency

AXX-45X	Regional Establishment Engineering Branch (Facilities and Equipment)
AXX-46X	Regional Maintenance Engineering Branch (Sector Maintenance)
AXX-5XX	Regional Air Traffic Division

AXX-45X	Regional Establishment Engineering Branch (Facilities and Equipment)
AXX-46X	Regional Maintenance Engineering Branch (Sector Maintenance)
AXX-5XX	Regional Air Traffic Division

APPENDIX D SITE DEPLOYMENT SCHEDULE

Appendix D (refer to section 11.2, Deployment Schedule) contains the proposed site deployment schedule contained in Part I, Section F, Deliveries or Performance, paragraph F.4.1, Potential ETVS Locations, of the Clearance Record Review version of the Request For Proposals dated April 1994. Delivery dates will be coordinated between Air Traffic Plans and Requirements Service, System Plans and Programs Division, Terminal Branch (APM Air Traffic Requirements), ATR-120 and regional personnel, and will be included after contract award.

FAA Organization ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
FAAAC	OK	FAA	TBD
FAAAC (Academy)	OK	FAA	TBD
FAATC	NJ	FAA	TBD
ASM-640	OK	FAA	TBD

Alaskan Region ETVS Sites

Facility Location	State	Site identifier	Proposed Delivery Date
Anchorage-Intl/TRN	AK	ANC	TBD
Anchorage-Merrill	AK	MRI	TBD
Fairbanks/TRN	AK	FAI	TBD

APPENDIX D SITE DEPLOYMENT SCHEDULE

Appendix D (refer to section 11.2, Deployment Schedule) contains the proposed site deployment schedule contained in Part I, Section F, Deliveries or Performance, paragraph F.4.1, Potential ETVS Locations, of the Clearance Record Review version of the Request For Proposals dated April 1994. Delivery dates will be coordinated between Air Traffic Plans and Requirements Service, System Plans and Programs Division, Terminal Branch (APM Air Traffic Requirements), ATR-120 and regional personnel, and will be included after contract award.

FAA Organization ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
FAAAC	OK	FAA	TBD
FAAAC (Academy)	OK	FAA	TBD
FAATC	NJ	FAA	TBD
ASM-640	OK	FAA	TBD

Alaskan Region ETVS Sites

Facility Location	State	Site identifier	Proposed Delivery Date
Anchorage-Intl/TRN	AK	ANC	TBD
Anchorage-Merrill	AK	MRI	TBD
Fairbanks/TRN	AK	FAI	TBD

Eastern Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Albany	NY	ALB	TBD
Allentown	PA	ABE	TBD
Atlantic City	NJ	ACY	TBD
Baltimore	MD	BWI	TBD
Binghamton	NY	BGM	TBD
Caldwell-Essex	NJ	CDW	TBD
Charleston	WV	CRW	TBD
Clarksburg	WV	CKB	TBD
Elmira	NY	ELM	TBD
Erie	PA	ERI	TBD
Farmingdale	NY	FRG	TBD
Huntington	WV	HTS	TBD
Islip McArthur	NY	ISP	TBD
Midlletown Harrisburg	PA	MDT	TBD
Morristown	NJ	MMU	TBD
N Philadelphia	PA	PNE	TBD
N .Y. Kennedy	NY	JFK	TBD
N.Y. Laguardia	NY	LGA	TBD
Newark	NJ	EWR	TBD
Newport News	VA	PHF	TBD
Niagara Falls	NY	IAG	TBD
Philadelphia	PA	PHL	TBD
Pittsburgh	PA	PIT	TBD
Poughkeepsie	NY	POU	TBD
Reading	PA	RDG	TBD
Richmond	VA	RIC	TBD
Roanoke	VA	ROA	TBD
Rochester	NY	ROC	TBD
Rome-Griff. AFB	NY	RME	TBD
Syracuse	NY	SYR	TBD
Teterboro	NJ	TEB	TBD
Trenton	NJ	TTN	TBD
Washington-Dulles	VA	IAD	TBD
Washington-National	DC	DCA	TBD
White Plains	NY	HPN	TBD
Wilkes Barre	PA	AVP	TBD

Eastern Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Albany	NY	ALB	TBD
Allentown	PA	ABE	TBD
Atlantic City	NJ	ACY	TBD
Baltimore	MD	BWI	TBD
Binghamton	NY	BGM	TBD
Caldwell-Essex	NJ	CDW	TBD
Charleston	WV	CRW	TBD
Clarksburg	WV	CKB	TBD
Elmira	NY	ELM	TBD
Erie	PA	ERI	TBD
Farmingdale	NY	FRG	TBD
Huntington	WV	HTS	TBD
Islip McArthur	NY	ISP	TBD
Midlletown Harrisburg	PA	MDT	TBD
Morristown	NJ	MMU	TBD
N Philadelphia	PA	PNE	TBD
N .Y. Kennedy	NY	JFK	TBD
N.Y. Laguardia	NY	LGA	TBD
Newark	NJ	EWR	TBD
Newport News	VA	PHF	TBD
Niagara Falls	NY	IAG	TBD
Philadelphia	PA	PHL	TBD
Pittsburgh	PA	PIT	TBD
Poughkeepsie	NY	POU	TBD
Reading	PA	RDG	TBD
Richmond	VA	RIC	TBD
Roanoke	VA	ROA	TBD
Rochester	NY	ROC	TBD
Rome-Griff. AFB	NY	RME	TBD
Syracuse	NY	SYR	TBD
Teterboro	NJ	TEB	TBD
Trenton	NJ	TTN	TBD
Washington-Dulles	VA	IAD	TBD
Washington-National	DC	DCA	TBD
White Plains	NY	HPN	TBD
Wilkes Barre	PA	AVP	TBD

New England Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Bangor	ME	BGR	TBD
Bedford	MA	BED	TBD
Boston	MA	BOS	TBD
Burlington	VT	BTV	TBD
Falmouth Otis	MA	FMH	TBD
Manchester	NH	MHT	TBD
Portland	ME	PWM	TBD
Providence	RI	PVD	TBD
Windsor Lock-BDL	CT	BDL	TBD

New England Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Bangor	ME	BGR	TBD
Bedford	MA	BED	TBD
Boston	MA	BOS	TBD
Burlington	VT	BTV	TBD
Falmouth Otis	MA	FMH	TBD
Manchester	NH	MHT	TBD
Portland	ME	PWM	TBD
Providence	RI	PVD	TBD
Windsor Lock-BDL	CT	BDL	TBD

Southern Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Asheville	NC	AVL	TBD
Atlanta-Fulton County	GA	FTY	TBD
Atlanta-Dekalb	GA	PDK	TBD
Atlanta-Hart	GA	ATL	TBD
Atlanta-Hart	GA	ATL	TBD
Augusta	GA	AGS	TBD
Birmingham	AL	BHM	TBD
Bristol-Tricity	TN	TRI	TBD
Charlotte-Douglas	NC	CLT	TBD
Charleston	SC	CHS	TBD
Chattanooga	TN	CHA	TBD
Columbia	SC	CAE	TBD
Covington-Greater Cincinnati	KY	CVG	TBD
Daytona	FL	DAB	TBD
Fayetteville	NC	FAY	TBD
Florence	SC	FLO	TBD
Fort Pierce	FL	FPR	TBD
Ft. Lauderdale-Exec	FL	FXE	TBD
Ft. Lauderdale-Intl	FL	FLL	TBD
Ft. Myers SW-RE	FL	RSW	TBD
Greensboro	NC	GSO	TBD
Greer-Spartenburg	SC	GSP	TBD
Gulfport	MS	GPT	TBD
Hollywod-N Perry	FL	HWO	TBD
Huntsville	AL	HSV	TBD
Jackson-Thompsn	MS	JAN	TBD
Jacksonville-Intl	FL	JAX	TBD
Knoxville-McKee	TN	TYS	TBD
Louisville-Bowm	KY	LOU	TBD
Louisville-Stnf	KY	SDF	TBD
Melbourne	FL	MLB	TBD
Memphis	TN	MEM	TBD
Meridian-McCain	MS	NMN	TBD
Miami Intl	FL	MIA	TBD
Miami-Opa Locka	FL	OPF	TBD
Miami-Tamiami	FL	TMB	TBD
Mobile	AL	MOB	TBD
Montgomery	AL	MGM	TBD
Myrtle Beach	SC	MYR	TBD

Southern Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Asheville	NC	AVL	TBD
Atlanta-Fulton County	GA	FTY	TBD
Atlanta-Dekalb	GA	PDK	TBD
Atlanta-Hart	GA	ATL	TBD
Atlanta-Hart	GA	ATL	TBD
Augusta	GA	AGS	TBD
Birmingham	AL	BHM	TBD
Bristol-Tricity	TN	TRI	TBD
Charlotte-Douglas	NC	CLT	TBD
Charleston	SC	CHS	TBD
Chattanooga	TN	CHA	TBD
Columbia	SC	CAE	TBD
Covington-Greater Cincinnati	KY	CVG	TBD
Daytona	FL	DAB	TBD
Fayetteville	NC	FAY	TBD
Florence	SC	FLO	TBD
Fort Pierce	FL	FPR	TBD
Ft. Lauderdale-Exec	FL	FXE	TBD
Ft. Lauderdale-Intl	FL	FLL	TBD
Ft. Myers SW-RE	FL	RSW	TBD
Greensboro	NC	GSO	TBD
Greer-Spartenburg	SC	GSP	TBD
Gulfport	MS	GPT	TBD
Hollywod-N Perry	FL	HWO	TBD
Huntsville	AL	HSV	TBD
Jackson-Thompsn	MS	JAN	TBD
Jacksonville-Intl	FL	JAX	TBD
Knoxville-McKee	TN	TYS	TBD
Louisville-Bowm	KY	LOU	TBD
Louisville-Stnf	KY	SDF	TBD
Melbourne	FL	MLB	TBD
Memphis	TN	MEM	TBD
Meridian-McCain	MS	NMN	TBD
Miami Intl	FL	MIA	TBD
Miami-Opa Locka	FL	OPF	TBD
Miami-Tamiami	FL	TMB	TBD
Mobile	AL	MOB	TBD
Montgomery	AL	MGM	TBD
Myrtle Beach	SC	MYR	TBD

Southwest Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Abilene	TX	ABI	TBD
Abilene-Dyess	TX	DYS	TBD
Albuquerque	NM	ABQ	TBD
Amarillo	TX	AMA	TBD
Austin	TX	AUS	TBD
Baton Rouge	LA	BTR	TBD
Beaumont	TX	BPT	TBD
Corpus Christi	TX	CRP	TBD
Dallas-Addison	TX	ADS	TBD
Dallas-Ft Worth	TX	DFW	TBD
Dallas-Ft Worth	TX	DFW	TBD
Dallas-Redbird	TX	RBD	TBD
El Paso	TX	ELP	TBD
Fayetteville	AR	FYV	TBD
Ft. Smith	AR	FSM	TBD
Ft. Worth-Meacham	TX	FTW	TBD
Houston	TX	IAH	TBD
Houston-Hobby	TX	HOU	TBD
Lafayette	LA	LFT	TBD
Little Rock	AR	LIT	TBD
Longview	TX	GGG	TBD
Lubbock	TX	LBB	TBD
Midland	TX	MAF	TBD
New Orleans	IA	MSY	TBD
New Orleans-Lakefront	LA	NEW	TBD
Oklahoma City	OK	OKC	TBD
San Antonio	TX	SAT	TBD
Shreveport-Regional	LA	SHV	TBD
Shreveport-Barksdale	LA	BAD	TBD
Tulsa-Intl	OK	TUL	TBD
Tulsa-Riverside	OK	RVS	TBD
Waco	TX	ACT	TBD

Southwest Region ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Abilene	TX	ABI	TBD
Abilene-Dyess	TX	DYS	TBD
Albuquerque	NM	ABQ	TBD
Amarillo	TX	AMA	TBD
Austin	TX	AUS	TBD
Baton Rouge	LA	BTR	TBD
Beaumont	TX	BPT	TBD
Corpus Christi	TX	CRP	TBD
Dallas-Addison	TX	ADS	TBD
Dallas-Ft Worth	TX	DFW	TBD
Dallas-Ft Worth	TX	DFW	TBD
Dallas-Redbird	TX	RBD	TBD
El Paso	TX	ELP	TBD
Fayetteville	AR	FYV	TBD
Ft. Smith	AR	FSM	TBD
Ft. Worth-Meacham	TX	FTW	TBD
Houston	TX	IAH	TBD
Houston-Hobby	TX	HOU	TBD
Lafayette	LA	LFT	TBD
Little Rock	AR	LIT	TBD
Longview	TX	GGG	TBD
Lubbock	TX	LBB	TBD
Midland	TX	MAF	TBD
New Orleans	IA	MSY	TBD
New Orleans-Lakefront	LA	NEW	TBD
Oklahoma City	OK	OKC	TBD
San Antonio	TX	SAT	TBD
Shreveport-Regional	LA	SHV	TBD
Shreveport-Barksdale	LA	BAD	TBD
Tulsa-Intl	OK	TUL	TBD
Tulsa-Riverside	OK	RVS	TBD
Waco	TX	ACT	TBD

Western Pacific Region ETVS Sites (continued)

Facility Location	State	Site Identifier	Proposed Delivery Date
Stockton	CA	SCK	TBD
Torrance	CA	TOA	TBD
Tucson-Davis Mt	AZ	DMA	TBD
Tuscon	AZ	TUS	TBD
Van Nuys	CA	VNY	TBD

DoD - Air Force ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
High Desert - Edwards (Navy)	CA	EDW	TBD
Air Force Academy	c o	AFF	TBD
Altus	OK	LTS	TBD
Anderson, Guam	GU	UAM	TBD
Aviano, Italy	IT	AVB	TBD
Barksdale	LA	BAD	TBD
Beale	CA	BAB	TBD
Bergstrom	TX	BSM	TBD
Bitburg, Germany	GE	BBJ	TBD
Buckley	c o	BKF	TBD
Cannon	NM	CVS	TBD
Columbus	MS	CBM	TBD
Davis Monthan	AZ	DMA	TBD
Dobbins	GA		TBD
Dover	DE	DOV	TBD
Duke Field - Eglin	FL	EGI	TBD
Dyess	TX	DYS	TBD
Eareckson	AK		TBD
Edwards	CA	EDW	TBD
Eglin	FL	VPS	TBD
Eielson	AK	EIL	TBD
Ellington	TX	EFD	TBD
Ellsworth	SD	RCA	TBD
Fairchild	WA	SKA	TBD
Gila Bend - Luke	AZ	GBN	TBD
Grand Forks	ND	RDR	TBD
Griffiss	NY	RME	TBD
Grissom	IN	GUS	TBD
Hill	UT	HIF	TBD
Holloman	NM	HMN	TBD
Holoman	NM	HMN	TBD
Homestead	FL	HST	TBD
Howard, Panama	PN	HOW	TBD
Hurlburt	FL	HRT	TBD
Incirlik			TBD
Indian Springs	NV	INS	TBD
K.I. Sawyer	MI	SAW	TBD
Kadena, Japan	JA	DNA	TBD

DoD - Air Force ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
High Desert - Edwards (Navy)	CA	EDW	TBD
Air Force Academy	c o	AFF	TBD
Altus	OK	LTS	TBD
Anderson, Guam	GU	UAM	TBD
Aviano, Italy	IT	AVB	TBD
Barksdale	LA	BAD	TBD
Beale	CA	BAB	TBD
Bergstrom	TX	BSM	TBD
Bitburg, Germany	GE	BBJ	TBD
Buckley	c o	BKF	TBD
Cannon	NM	CVS	TBD
Columbus	MS	CBM	TBD
Davis Monthan	AZ	DMA	TBD
Dobbins	GA		TBD
Dover	DE	DOV	TBD
Duke Field - Eglin	FL	EGI	TBD
Dyess	TX	DYS	TBD
Eareckson	AK		TBD
Edwards	CA	EDW	TBD
Eglin	FL	VPS	TBD
Eielson	AK	EIL	TBD
Ellington	TX	EFD	TBD
Ellsworth	SD	RCA	TBD
Fairchild	WA	SKA	TBD
Gila Bend - Luke	AZ	GBN	TBD
Grand Forks	ND	RDR	TBD
Griffiss	NY	RME	TBD
Grissom	IN	GUS	TBD
Hill	UT	HIF	TBD
Holloman	NM	HMN	TBD
Holoman	NM	HMN	TBD
Homestead	FL	HST	TBD
Howard, Panama	PN	HOW	TBD
Hurlburt	FL	HRT	TBD
Incirlik			TBD
Indian Springs	NV	INS	TBD
K.I. Sawyer	MI	SAW	TBD
Kadena, Japan	JA	DNA	TBD

DoD - Air Force ETVS Sites (continued)

FacilityLocation	State	Site Identifier	Proposed Delivery Date
Reese	TX	REE	TBD
Robins	GA	WRB	TBD
Scott	IL	BLV	TBD
Selfridge	MI	MTC	TBD
Seymour Johnson	NC	GSB	TBD
Shaw	SC	SSC	TBD
Shemya	AK	SYA	TBD
Sheppard	TX	SPS	TBD
Spangdahlem, Germany	GE	SPM	TBD
Springfield	OH	SGH	TBD
Thule, Greenland	GR	THU	TBD
Tinker	OK	TIK	TBD
Tonopah Test Range	NV	NV70	TBD
Travis	CA	SUU	TBD
Tyndall	FL	PAM	TBD
Vance	OK	END	TBD
Vandenberg	CA	VBG	TBD
Volk Field	WI	VOK	TBD
Whiteman	MO	SZL	TBD
Wright-Patterson	OH	FFO	TBD
Yokota, Japan	JA	OKO	TBD

DoD - Air Force ETVS Sites (continued)

FacilityLocation	State	Site Identifier	Proposed Delivery Date
Reese	TX	REE	TBD
Robins	GA	WRB	TBD
Scott	IL	BLV	TBD
Selfridge	MI	MTC	TBD
Seymour Johnson	NC	GSB	TBD
Shaw	SC	SSC	TBD
Shemya	AK	SYA	TBD
Sheppard	TX	SPS	TBD
Spangdahlem, Germany	GE	SPM	TBD
Springfield	OH	SGH	TBD
Thule, Greenland	GR	THU	TBD
Tinker	OK	TIK	TBD
Tonopah Test Range	NV	NV70	TBD
Travis	CA	SUU	TBD
Tyndall	FL	PAM	TBD
Vance	OK	END	TBD
Vandenberg	CA	VBG	TBD
Volk Field	WI	VOK	TBD
Whiteman	MO	SZL	TBD
Wright-Patterson	OH	FFO	TBD
Yokota, Japan	JA	OKO	TBD

DoD - Navy ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Brunswick	ME	NHZ	TBD
Camp Pendleton	CA	NFG	TBD
Charleston	SC	NAO	TBD
China Lake	CA	NID	TBD
Corpus Christi	TX	NGP	TBD
Dallas (Carswell AFB)	TX	NBE	TBD
Futenma	JA	NFO	TBD
Guantanamo Bay	CU	NAW	TBD
Hawaii	HI		TBD
Imperial Beach (North Island)	CA	NRS	TBD
Iwakuni, Japan	JA	NEU	TBD
Jacksonville	FL	NIP	TBD
Jacksonville	FL		TBD
Kaneohe Bay	HI	NGF	TBD
Keflavik, Iceland	IC	NKU	TBD
Key West	FL	NQX	TBD
Lemoore	CA	NLC	TBD
Mayport	FL	NRB	TBD
Memphis	TN	NQA	TBD
Miramar	CA	NKX	TBD
New Orleans	LA	NBG	TBD
New River	NC	NCA	TBD
North Island	CA	NZY	TBD
Orange Grove (Kingsville)	TX	NQI	TBD
Quantico	VA	NYG	TBD
Roosevelt Roads	PR	NRR	TBD
Rota, Spain	SP	GRO	TBD
San Diego	CA		TBD
Vacapes	VA		TBD
Whiting Field	FL		TBD
Willow Grove	PA	NXX	TBD
Yuma	AZ	NYL	TBD

DoD - Navy ETVS Sites

Facility Location	State	Site Identifier	Proposed Delivery Date
Brunswick	ME	NHZ	TBD
Camp Pendleton	CA	NFG	TBD
Charleston	SC	NAO	TBD
China Lake	CA	NID	TBD
Corpus Christi	TX	NGP	TBD
Dallas (Carswell AFB)	TX	NBE	TBD
Futenma	JA	NFO	TBD
Guantanamo Bay	CU	NAW	TBD
Hawaii	HI		TBD
Imperial Beach (North Island)	CA	NRS	TBD
Iwakuni, Japan	JA	NEU	TBD
Jacksonville	FL	NIP	TBD
Jacksonville	FL		TBD
Kaneohe Bay	HI	NGF	TBD
Keflavik, Iceland	IC	NKU	TBD
Key West	FL	NQX	TBD
Lemoore	CA	NLC	TBD
Mayport	FL	NRB	TBD
Memphis	TN	NQA	TBD
Miramar	CA	NKX	TBD
New Orleans	LA	NBG	TBD
New River	NC	NCA	TBD
North Island	CA	NZY	TBD
Orange Grove (Kingsville)	TX	NQI	TBD
Quantico	VA	NYG	TBD
Roosevelt Roads	PR	NRR	TBD
Rota, Spain	SP	GRO	TBD
San Diego	CA		TBD
Vacapes	VA		TBD
Whiting Field	FL		TBD
Willow Grove	PA	NXX	TBD
Yuma	AZ	NYL	TBD

P6690.06

9/13/94

Enhanced Terminal Voice Switch (ETVS)

Project Implementation Plan (PIP)

U.S. Department of Transportation

Federal Aviation Administration

Distribution: A-W (NC/SE/LM/TR) - 3; A-Z (LOS) - 3; A-Y (DE/AY) - 3; A-FAF-7 (LTD); A-FAT-2/8 (LTD) Initiated by ANC-200